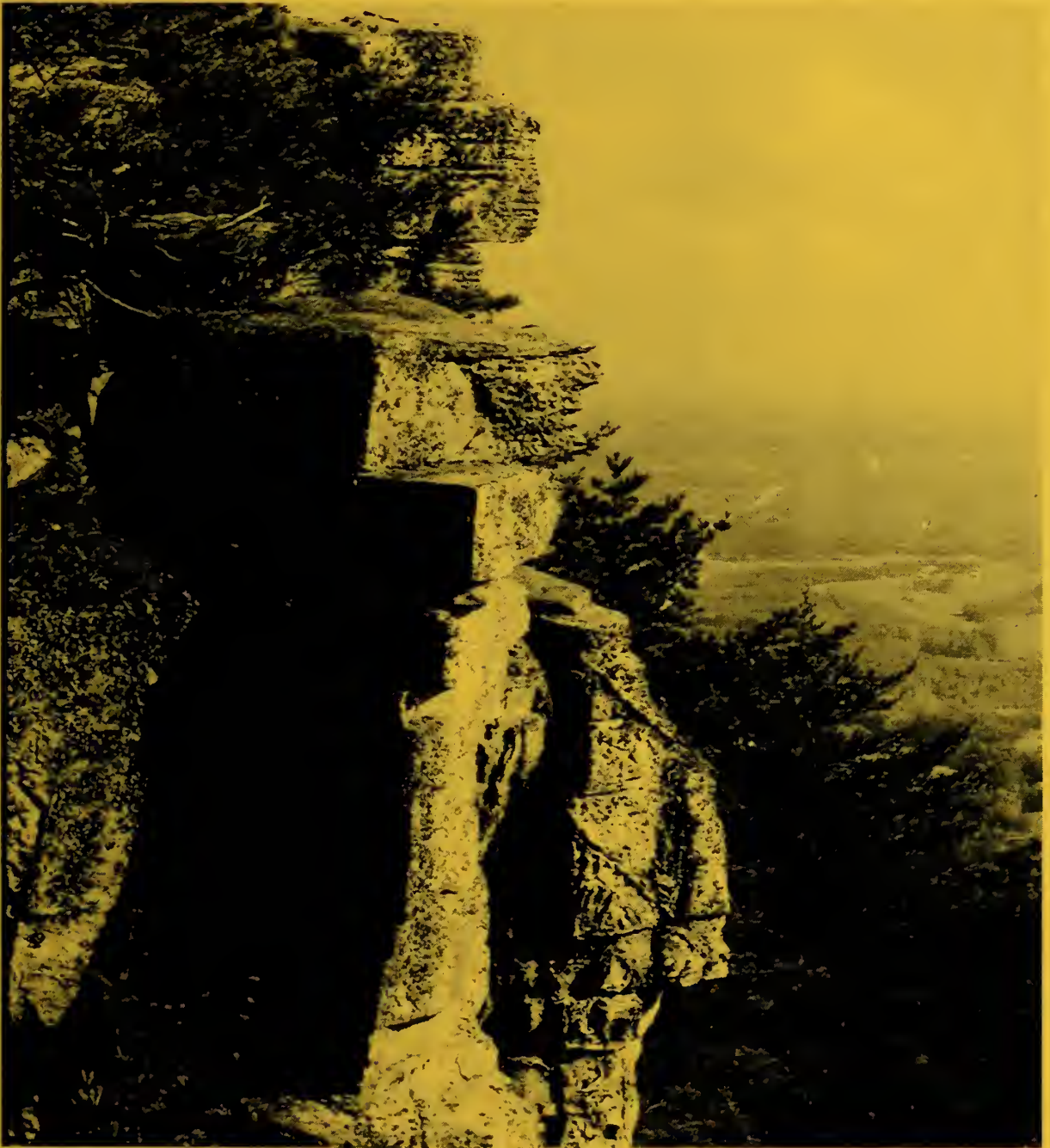


Hanging Rock State Park

General Management Plan



GENERAL MANAGEMENT PLAN
FOR
HANGING ROCK STATE PARK

Department of Environment, Health, and Natural Resources

Division of Parks and Recreation

Planning and Development Section

May, 1994

INTRODUCTION

Planning is an essential element of effective and efficient park administration and management. The North Carolina General Assembly acknowledged its importance by passing state parks system legislation that includes planning requirements.

The 1987 State Parks Act (G.S.114-44.7 through 114-44.14) stipulates that a State Parks System Plan be prepared. Such a plan was completed in December of 1988. It evaluated the statewide significance of parks, identified duplications and deficiencies in the system, described the resources of the system, proposed solutions to problems, described anticipated trends, and recommended means and methods to accommodate trends.

The State Parks Act also requires each park to have an individual general management plan. The general management plans are required to:

...include a statement of purpose for the park based upon its relationship to the System Plan and its classification. An analysis of the major resources and facilities on hand to achieve those purposes shall be completed along with a statement of management direction. The general management plan shall be revised as necessary to comply with the System Plan and to achieve the purpose of the [State Parks Act].

A GMP is to be a comprehensive five-year plan of management for a park unit. GMP's function to:


1. describe park resources and facilities;
2. state the purpose and importance of each park unit;
3. outline interpretive themes and propose locations for informational and interpretive facilities;
4. analyze park and recreation demands and trends in the park's service area;
5. summarize the primary laws guiding park operations;
6. identify internal and external threats to park natural and cultural resources, and propose appropriate responses;
7. identify and set priorities for capital improvement needs;
8. analyze visitor services and propose efficient, effective, and appropriate means of responding to visitor needs; and
9. review park operations and identify actions to support efficient and effective park administrative procedures.

The GMP for Hanging Rock State Park, developed with public involvement, is intended to serve these purposes.

TABLE OF CONTENTS

	<u>Page</u>
INTRODUCTION	
I. DESCRIPTION OF PARK RESOURCES AND FACILITIES	I-1
Location.....	I-1
Land Base.....	I-1
Visitor Use Facilities.....	I-1
History of the Park Area.....	I-3
II. PARK PURPOSES.....	II-1
State Parks System Mission Statement.....	II-1
Park Purpose Statement.....	II-1
III. SUMMARY OF INTERPRETIVE THEMES.....	III-1
Primary Interpretive Themes.....	III-1
Secondary Interpretive Themes.....	III-2
IV. PARK AND RECREATION DEMAND AND TRENDS.....	IV-1
Visitation Trends.....	IV-1
Population Trends.....	IV-1
Population Trends by Age Group.....	IV-3
Outdoor Recreation Participation in North.....	IV-3
Carolina	
Priorities of Public Outdoor Recreation Funding....	IV-5
Recreation Opportunities in Close Proximity.....	IV-7
Management Implications of Demographic and	IV-7
Socioeconomic Trends	
V. SUMMARY OF LAWS GUIDING PARK MANAGEMENT.....	V-1
State Legal Mandates.....	V-1
Federal Laws.....	V-3
State Policies	V-4
Park Master Plan.....	V-5
VI. NATURAL AND CULTURAL RESOURCE MANAGEMENT.....	VI-1
Natural Resource Management Policy.....	VI-1
Natural Communities	VI-2
Natural Heritage Program Element Occurrences.....	VI-6
Registered Natural Heritage Areas	VI-8
Potential Additions to Registered Natural Areas ...	VI-10
Resource Management Issues	VI-10

	<u>Page</u>
VII. PHYSICAL PLANT INVENTORY	VII-1
Facility Inventory and Inspection Program.....	VII-1
Facility Repair and Demolition Needs.....	VII-4
Facility Repair and Demolition Cost Summary.....	VII-8
Road and Utility Inventory.....	VII-9
Major Capital Improvement Project Priorities.....	VII-17
Recommended Changes to Project Priorities.....	VII-17
VIII. PARK OPERATIONS.....	VIII-1
Introduction.....	VIII-1
Staffing.....	VIII-1
Operating and Equipment Budget.....	VIII-3
Intrepretation and Education Programs.....	VIII-7
Rock Climbing	VIII-9
Recruiting and Retaining Lifeguards.....	VIII-10
Staff Training.....	VIII-11
Dan River Section	VIII-12
Trail System.....	VIII-13
IX. LAND ACQUISITION NEEDS	IX-1
Land Acquisition Status.....	IX-1
Land Acquisition Needs.....	IX-1
APPENDIX A: PARK PROFILE.....	A-1
APPENDIX B: CAPITAL IMPROVEMENT REQUESTS.....	B-1



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I. DESCRIPTION OF PARK RESOURCES AND FACILITIES

LOCATION

Hanging Rock is located in the Sauratown mountain range in the Piedmont Province of North Carolina. It is in Stokes County, approximately four miles west of Danbury. The park is accessible via Moore's Spring Road (SR 1001), which is between N.C. 89 and N.C. 66.

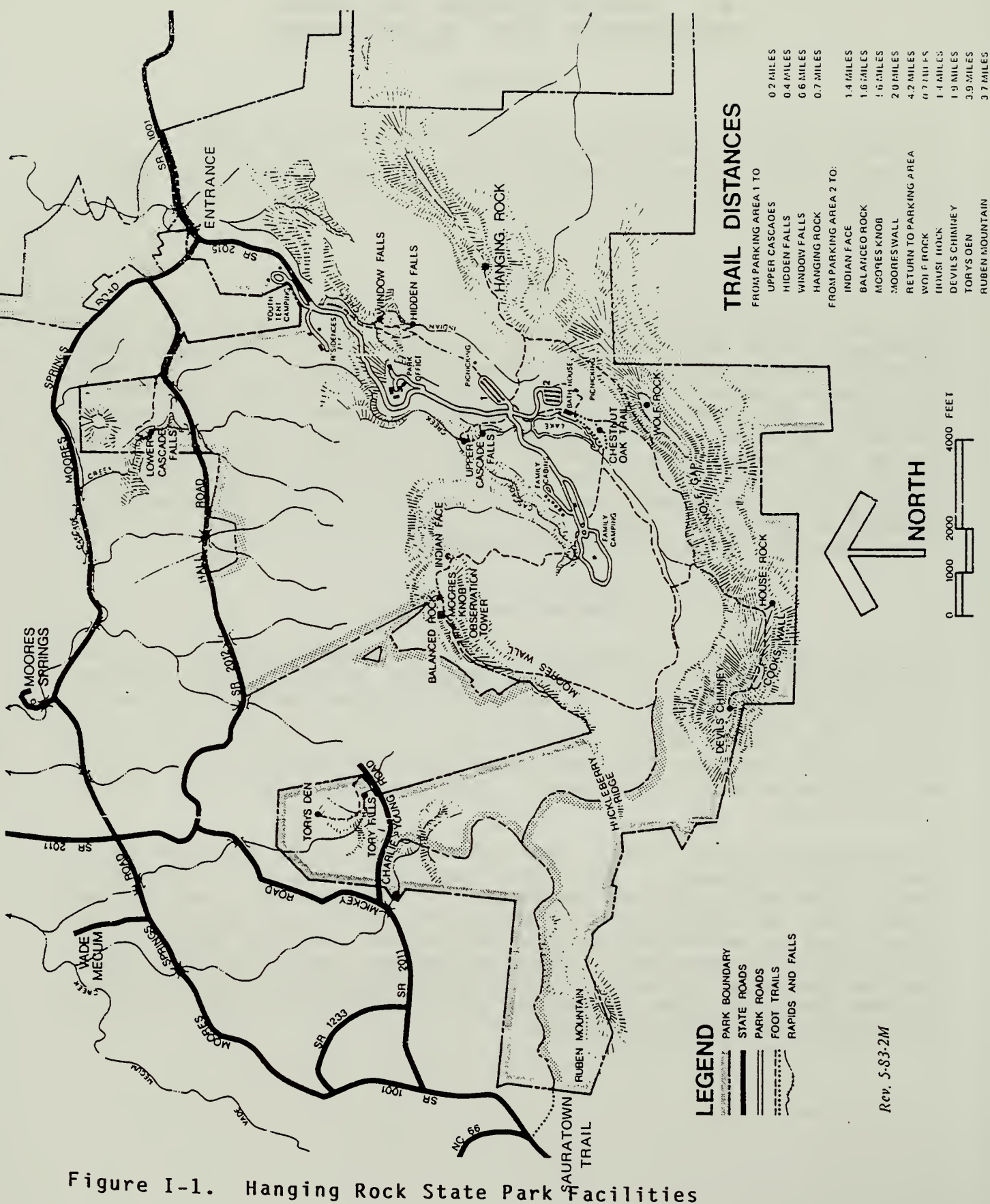
LAND BASE

The park consists of 6,341 acres in the Sauratown Mountains. The mountains were once part of an ancient plain, which has been removed through erosion. The ridges and knobs that remain are made of erosion resistant quartzite that withstood the weathering process. The area is characterized by steeply sloping wooded terrain, with large outcrop areas and cliffs rising 1,700 feet above the surrounding Piedmont. The prominent mountain peaks, knobs, and ridges include Moore's Knob, Cook's Wall, Wolf Rock, and Hanging Rock. Numerous creeks flow over the outcrop areas and form several waterfalls. Hidden Falls, Window Falls, and the Upper and Lower Cascade Falls are notable examples.

VISITOR FACILITIES

Visitor facilities at Hanging Rock State Park provide opportunities for hiking, picnicking, camping, swimming, nature study, boating, and fishing (Figure I-1). A network of hiking trails totalling 18 miles, as well as two miles of horse trails, is located in the park. Two picnic areas, with a total of 137 picnic tables, are available. One area is located near the lake and the other area is at the Window Falls Trail head. Three picnic shelters are available as well.

Hanging Rock State Park is one of the two North Carolina state parks offering cabins. Six cabins are available on a reservation basis from March through November. A 73-site tent and trailer campground is available for groups of up to six people. The campground is served by two wash houses with showers and toilets. No hook-ups are provided. Organized groups, such as scout troops, can use the park's primitive group camp. The group camp is a large undeveloped area where services are restricted to pit privies, drinking water, and fire rings.



A pristine 12-acre lake is one of the primary day-use areas in the park. A sandy swimming beach with a designated swimming area is open to the public during the summer months. The beach is served by a wheelchair-accessible bathhouse. A boat dock providing rental boats is also located on the lake.

HISTORY OF THE PARK AREA

According to research by the North Carolina Division of Archives and History, Stokes County and the Hanging Rock area were inhabited by the Saura Indian tribe prior to European settlement. A Saura village existed along the Dan River but was no longer occupied in the 1750's, according to historical records. The first European settlers in the area were German and Scots-Irish who came from more northern states. The land comprising the current day park was settled more slowly than surrounding areas because of the mountain terrain. Settlements at the base of the mountain were established by the time of the Revolutionary War. Stokes County was mainly used for farming, although an iron industry developed from several forges that operated as early as the 1790's.

Stokes County became a popular resort area following the Civil War as tourists were attracted by the mineral springs. Several resorts were successful through the turn of the 20th century, but these had all closed by the 1920's.

A decade of land speculation occurred prior to the establishment of the state park. The land that would become the core of the park was transferred four times from 1925 through 1935. Finally, Hanging Rock State Park was established in 1936 when the Winston-Salem Foundation, a local philanthropic organization, sold the property to the State of North Carolina for ten dollars. The reverter clause in the deed specified that the property was conveyed "upon the condition that a state or national park be constructed." The Winston-Salem Foundation had been founded by Colonel Henry Fries, president of Wachovia Bank.

A citizens' group, the Stokes County Committee for Hanging Rock State Park, and local politicians supported the state park's completion in cooperation with the Civilian Conservation Corps (CCC). The first access road opened was completed in 1936 and other visitor facilities followed shortly. By the end of World War II, the lake had been impounded, and the bathhouse, a large picnic shelter, restrooms, parking areas, and utilities had been completed. The park formally opened on July 21, 1944, although the public had been using the area previously.

Cabins and the campground were added in the 1950's as Hanging Rock became the most popular state park. By 1958, average attendance on summer weekends reached 10,000.

II. PARK PURPOSE

STATE PARKS SYSTEM MISSION STATEMENT

The North Carolina state parks system exists for the enjoyment, education, health, and inspiration of all our citizens and visitors. The mission of the state parks system is to conserve and protect representative examples of the natural beauty, ecological features, and recreation resources of statewide significance; to provide outdoor recreation opportunities in a safe and healthy environment; and to provide education opportunities that promote stewardship of the state's natural heritage.

HANGING ROCK STATE PARK PURPOSE STATEMENT

Hanging Rock and the Sauratown Mountains are dominant landmarks in the northwest Piedmont province. The natural beauty of the mountain vistas and spectacular waterfalls so inspired the local residents that they supported placing the area in public ownership. Hanging Rock State Park was established in 1936 when the Winston-Salem Foundation, a local philanthropic organization, sold the property to the State of North Carolina for ten dollars. The reverter clause in the deed specified that the property was conveyed "upon the condition that a state or national park be constructed." A citizens' group and local politicians supported the state park's completion in cooperation with the Civilian Conservation Corps (CCC). The combination of significant natural resources, breathtaking scenic panoramas, and attractive visitor facilities make Hanging Rock State Park one of North Carolina's premier parks.

Hanging Rock State Park's significant geological resources are a consequence of its location in the Sauratown Mountains, a ridge line separated from the Blue Ridge Mountains. The mountains were formed by a 200-foot-thick layer of erosion-resistant quartzite that became exposed as the surrounding land weathered away, leaving prominent monadnocks. The erosion, combined with a gradual uplifting of the rock, produced the Sauratown window (anticlinorium), which exposes rocks that would be otherwise hidden beneath the rocks of the surrounding Piedmont terrain. The exposed quartzite creates numerous large outcrops and cliffs, including Moore's Knob, Devil's Chimney, Wolf Rock, and Hanging Rock. At some of the outcrops, the steep terrain and mountain streams combine to form outstanding waterfalls. Flexible sandstone (itacolumite) is found only in the Sauratown Mountains. The park preserves some of the best examples of flexible sandstone, which is formed with interlocking quartz and mica flakes.

The park's significant biological resources are typified by the presence of natural communities normally located in the moun-

tains. These disjunct montane communities include Low-Elevation Rocky Summit, Montaine Acidic Cliffs, Carolina Hemlock Bluffs, Pine-Oak Heath, and Chestnut Oak Forest. In fact, the park is one of only a few known locations where Carolina hemlock and Canadian hemlock coexist. The three registered natural areas that have been designated are the Moore's Knob/Cook's Wall Natural Area, the Hanging Rock Summit Natural Area, and the Cascade Creek Natural Area. In addition, the park contains seven rare plant species, including witch-adler and Bradley's spleenwort, and two special animal species, Wehrle's salamander and the brown elfin butterfly.

The striking contrast between the Sauratown Mountains, which rise to over 2500 feet, and the rolling Piedmont landscape creates the park's most significant scenic resource. Moore's Knob, the highest peak in the range, rises more than 1700 feet above the surrounding land. The views available to park visitors from the mountain cliffs are the park's most notable scenic resource. Picturesque cascades and waterfalls, including Window Falls, Hidden Falls, Tory's Den Falls and the Upper and Lower Cascade Falls, are the most significant natural water features. The lake impoundment has also become a significant scenic area. The clear water lake, with its wooded shoreline and Moore's Knob visible in the distance, provides a unique mountain vista.

Significant recreational resources include both natural and developed resources supporting many opportunities for natural-resource-oriented recreation. Interpretation and education should be emphasized because of the park's natural significance and proximity to population centers. The park's extensive undeveloped areas provide excellent opportunities to experience a natural setting predominated by the forces of nature. Extensive mountain terrain is available for hiking. Scenic cliffs and waterfalls serve as hiking trail destinations, while all trails provide opportunities to view wildlife. The Dan River offers canoeing and fishing opportunities. Cook's Wall and Moore's Wall are sheer rock surfaces suitable for rock climbing.

A bowl-like area, rimmed by Moore's Knob and Wall, Cook's Wall, and Hanging Rock Ridge, contains slopes suitable for visitor facilities. The Civilian Conservation Corps established the first access road to this area and then developed a lake impoundment for swimming, fishing and boating, a large stone bathhouse, and a picnic shelter. These CCC facilities create the park's distinctive architectural character. A wide range of overnight opportunities were added later, including family camping, group camping, and cabins.

The CCC structures have become significant historic resources because of their architecture and their connection to the federal public works programs during the Great Depression. The bathhouse was placed on the Register of National Historic Places in 1991. Significant prehistoric archaeologic resources have not yet been

discovered due to limited investigation. The Sauras, a Native American tribe, had a village on the Dan River in Stokes County until the end of the 17th century. The tribe used the river as a transportation corridor, and artifacts probably remain.

Hanging Rock was authorized as a state park so that its valuable scenic, archaeological, geological, recreational, and biological values could be protected. The Division of Parks and Recreation is charged with preserving these values and providing park experiences that promote pride in and understanding of North Carolina's natural heritage.

III. SUMMARY OF INTERPRETIVE THEMES

The 1987 State Parks Act defines the purposes of the state parks system. It establishes that:

The State of North Carolina offers unique archaeologic, geologic, biologic, scenic and recreational resources. These resources are part of the heritage of the people of this State. The heritage of a people should be preserved and managed by those people for their use and for the use of their visitors and descendents.

It further provides that:

Park lands are to be used by the people of this State and their visitors in order to promote understanding of and pride in the natural heritage of this State.

One of the best methods of meeting these purposes is through environmental education. The Department of Environment, Health, and Natural Resources has adopted the following definition of environmental education:

Environmental education is a process that increases awareness, knowledge, and understanding of natural systems -- the interdependence of living things, the impact of human activities -- and results in informed decisions, responsible behavior, and constructive action.

Hanging Rock State Park is well suited to environmental education, with its excellent representation of geology and habitat types found in the Sauratown Mountains.

Hanging Rock State Park has one primary interpretive theme and four secondary themes. The primary theme is the interpretation of Hanging Rock's geology as a quartzite monadnock.

PRIMARY INTERPRETIVE THEMES

GEOLOGY OF HANGING ROCK

The geologic formation known as Hanging Rock is a quartzite monadnock located at the eastern end of the Sauratown Mountain Range. Educational activities will emphasize the theories explaining the formation of the park's geologic features.

SECONDARY INTERPRETIVE THEMES

Four secondary interpretive themes have been identified. They are:

- C.A.T.C.H. (Teaching youth to how to fish) Program
- Rare and Endangered Species
- Plant Communities
- Civilian Conservation Corps

IV. PARK AND RECREATION DEMAND AND TRENDS

VISITATION TRENDS

Hanging Rock State Park has been one the N.C. State Parks System's "flagship" parks for nearly 50 years, and visitation has remained consistently high. Annual visitation ranged between 200,000 and 300,000 almost every year since 1975. Over 250,000 visits have been recorded every year since 1987 (Figure IV-1).

Visitation trends should remain relatively stable or increase slightly because the park will continue to be a favorite destination for North Carolinians and future development will be limited. The park's spectacular scenery and easy access from the Triad area (Greensboro, Winston-Salem, and High Point) should maintain or increase the park's popularity. Annual visits should not dramatically increase, however, because the park's master plan facilities are nearly complete and current overnight facilities and parking lots are often used to capacity. The only new facilities recommended for Hanging Rock State Park are a new visitor center and four more cabins (see Chapter 7 for capital improvement priorities).

Hanging Rock State Park has a peak visitor-use season that extends from May until October (Figure IV-2). In 1990 and 1991, Hanging Rock State Park's monthly visitation fluctuated between 20,000 (in September) and 40,000 (in July) during this peak season. The lowest visitation is usually recorded during December.

POPULATION TRENDS

The area served by Hanging Rock State Park is identified as the following six counties for this analysis: Forsyth, Guilford, Rockingham, Stokes, Surry, and Yadkin. The total population in the region was 828,777 in 1990, an 8.3 percent increase over the 1980 population of 765,258.

During the next ten years, it is predicted the population will grow by an estimated 9.3 percent, or over 76,000 people. Most of the population increase will occur in Forsyth and Guilford counties. The population in Stokes County, where the park is located, is expected to increase by a slightly higher rate of 10.7 percent.

ANNUAL VISITATION TRENDS 1975 - 1991

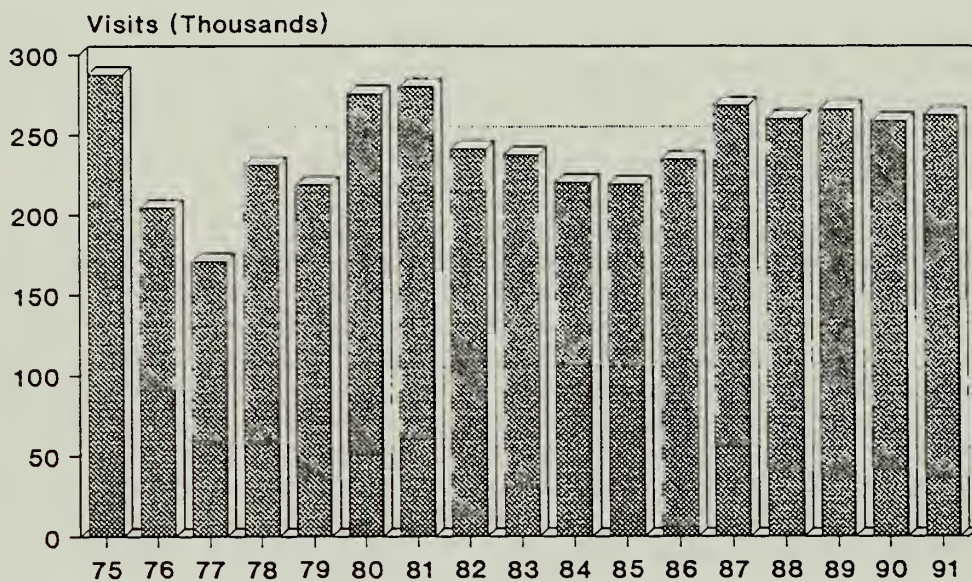


Figure IV-1. Annual Visitation Trends.

MONTHLY VISITATION

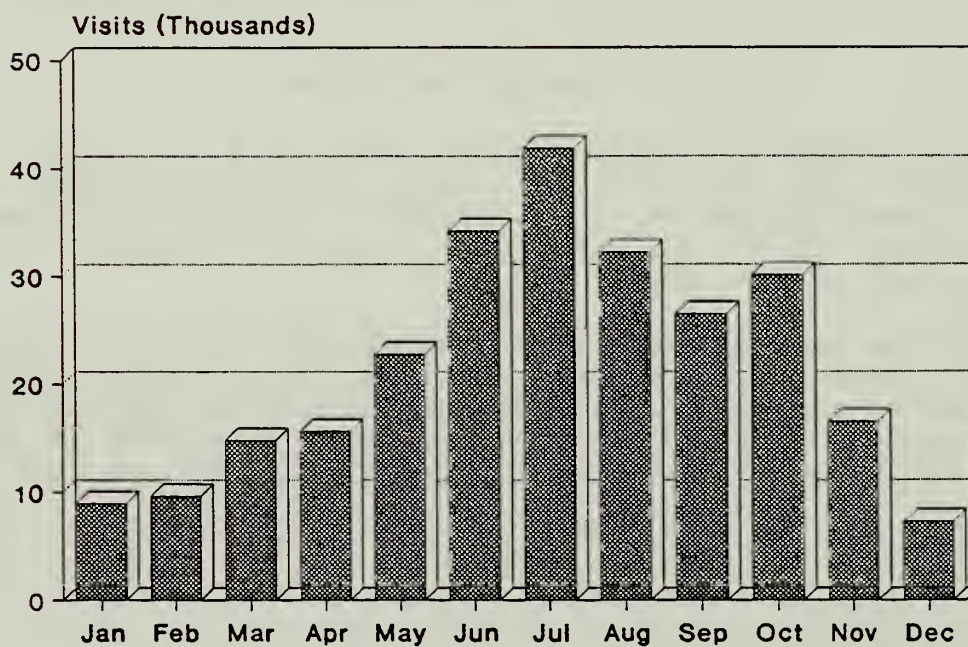


Figure IV-2. Average Monthly Visitation 1990-1991.

POPULATION TRENDS BY AGE GROUP

The region's population will experience an aging trend that is evident throughout North Carolina. The state median age will increase from 29.6 in 1980 to 33.1 in 1990. The aging trend is reflected in the large increases in the age groups above 40 years old (Figure IV-3). Only the 20 to 29-year-old age group will decrease significantly between 1990 and 2000. The 0-9 year old age will increase by over 10,000 children during the next decade.

OUTDOOR RECREATION PARTICIPATION IN NORTH CAROLINA

The five most popular outdoor recreation activities in North Carolina are walking for pleasure, driving for pleasure, viewing scenery, beach activities, and visiting historical sites. Three out of every four households participated in walking for pleasure at least once in the past twelve months (Table IV-1). In addition to the five most popular activities, over 50 percent of the households responding to a 1989 survey participated at least once in the following activities: swimming (in lakes, rivers, or oceans), visiting natural areas, picnicking, attending sports events, visiting zoos, and freshwater fishing.

The North Carolina Outdoor Recreation Participation Survey was mailed to 3,100 randomly selected residents in the spring of 1989. Forty-five percent or 1,399 people returned completed surveys. Each person receiving the survey was asked to estimate the number of times the members of his/her household had participated in each of 43 activities.

REGIONAL AGE GROUP TRENDS 1980 - 2000

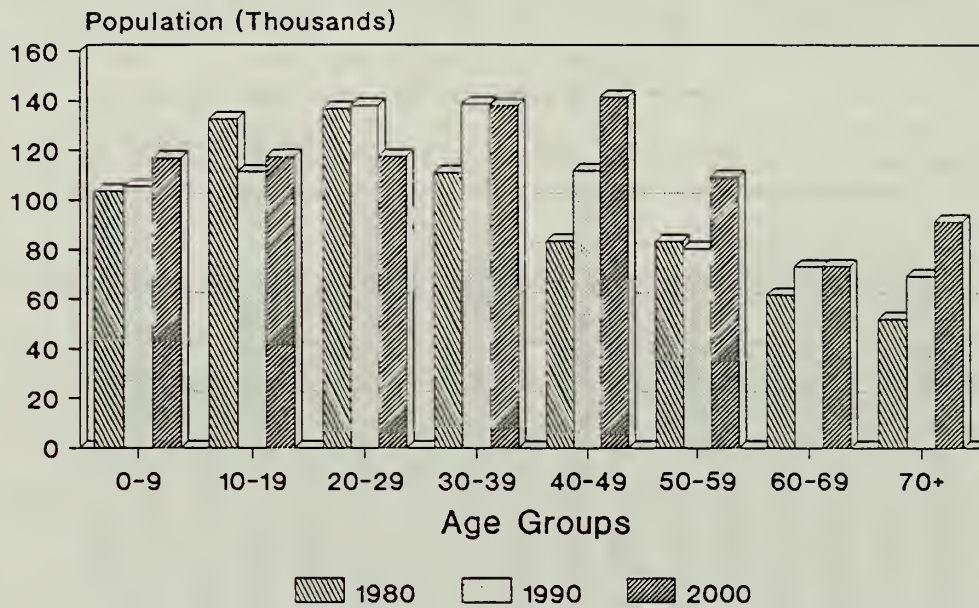


Figure IV-3. Hanging Rock State Park Market Region Age Group Trends

Table IV-1. Outdoor recreation activities ranked by popularity

Rank	Activity	Percentage of Households Participating
1.	Walking for Pleasure	75%
2.	Driving for Pleasure	72
3.	Viewing Scenery	71
4.	Beach Activities	69
5.	Visiting Historical Sites	62
6.	Swimming (in Lakes, Rivers, and Oceans)	54
7.	Visiting Natural Areas	53
8.	Picnicking	52
9.	Attending Sports Events	52
10.	Visiting Zoos	51
11.	Fishing - Freshwater	50
12.	Use of Open Areas	41
13.	Swimming (in Pools)	40
14.	Fishing - Saltwater	38
15.	Attending Outdoor Cultural Events	35
16.	Bicycling for Pleasure	32
17.	Other Winter Sports	31
18.	Camping, Tent or Vehicle	29
19.	Softball and Baseball	28
20.	Hunting	28
21.	Use of Play Equipment	28
22.	Power Boating	26
23.	Trail Hiking	26
24.	Jogging or Running	24
25.	Basketball	24
26.	Nature Study	22
27.	Golf	22
28.	Target Shooting	20
29.	Water Skiing	19
30.	Camping, Primitive	14

PRIORITIES FOR PUBLIC OUTDOOR RECREATION FUNDING

The North Carolina Outdoor Recreation Survey asked residents a series of questions to determine their unmet outdoor recreation demands and their support for public funding to provide additional public facilities for these activities. As a result, a statewide needs assessment was accomplished. Future demand was determined by asking citizens which activities they would have tried more often if adequate facilities were available. Respondents were then asked to rank these activities in order of importance. A scoring system designed to highlight the highest priorities was then used to assign each activity a rating of high, moderate or low future demand based on the survey results.

In the second part of the analysis, public support for funding outdoor recreational needs was determined by asking respondents to identify and rank those activities to which government should give the highest priority when spending public money. Again, respondents ranked the activities in order of importance. The scoring system used to analyze unmet demand was used again to assign each activity a rating of high, moderate, or low public support for public funding based on the survey results.

The needs assessment then combined the two ratings for each activity to produce a score of from one to nine, with one being the highest priority and nine the lowest. The activities given higher priority in the needs assessment are those that received high support for public funding as well as high future demand scores (Table IV-2).

Based on this analysis, the activities rated as having the highest priorities are activities that are currently or could potentially be provided at Hanging Rock State Park. The activities include walking for pleasure, tent or vehicle camping, picnicking, visiting natural areas, viewing scenery, trail hiking, and using open areas.

Table IV-2. Priorities for Future Outdoor Recreation Activities

Activity	Code	Future Demand	Support for Public Funding
Walking for Pleasure	1	High	High
Camping, Tent or Vehicle	1	High	High
Picnicking	1	High	High
Beach Activities	1	High	High
Fishing - Freshwater	1	High	High
Attend Outdoor Cultural Events	1	High	High
Visiting Natural Areas	2	High	Moderate
Use of Play Equipment	2	High	Moderate
Visiting Zoos	2	High	Moderate
Visiting Historical Sites	2	High	Moderate
Bicycling for Pleasure	3	Moderate	High
Swimming (in Pools)	3	Moderate	High
Viewing Scenery	4	Moderate	Moderate
Hunting	4	Moderate	Moderate
Trail Hiking	4	Moderate	Moderate
Use of Open Areas	4	Moderate	Moderate
Target Shooting	4	Moderate	Moderate
Swimming (Lakes, Rivers, Ocean)	4	Moderate	Moderate
Fishing - Saltwater	4	Moderate	Moderate

RECREATION OPPORTUNITIES IN CLOSE PROXIMITY

Pilot Mountain State Park is within a one-hour drive of Hanging Rock State Park and offers similar recreational opportunities, including tent and trailer camping, hiking, picnicking, horseback riding, and rock climbing. Two locally operated campgrounds are also located in adjacent counties. Tanglewood Park, operated by Forsyth County, offers tent and trailer camping as well as resort facilities such as golf courses and a lodge. Lake Reidsville in Rockingham County provides a range of water-based activities.

Two commercial campgrounds are in the vicinity, including a tent and trailer campground adjacent to the park and the Blue Ridge Foothills Campground (36 trailer sites, near Dobson).

MANAGEMENT IMPLICATIONS OF DEMOGRAPHIC AND SOCIOECONOMIC TRENDS

Listed below are management implications of trends identified in the Systemwide Plan for the State Parks System that are relevant to Hanging Rock State Park.

- Families constitute 60 percent of the groups visiting the state parks system, according to the 1986 Public Area Recreation Visitor Study (PARVS) survey in North Carolina. Population projections predict the birth rate will continue to increase through the end of the century. As these new families demand recreation and park opportunities, the system should experience increased demand for children's programs and facilities. The proposed visitor center, with exhibits, classroom space, and additional interpretive staff, will provide a significant improvement to the park's ability to address this need.

It will be important to develop interpretative centers and environmental education programs to accommodate this increased population of children and to instill an environmental ethic in the new generation. The proposed visitor center has significant potential for portraying the park's interpretative themes if exhibits and educational equipment are funded.

- The growing elderly population has more leisure time but participates in active leisure activities less frequently than younger age groups. Declining health is the most frequent reason cited for giving up an activity. The elderly are therefore more concerned with the safety, quality and accessibility of park facilities. Bus tours, which provide the elderly with greater mobility and opportunities for socializing, are becoming increasingly popular. State parks should be capable of accommodating bus tours and large school groups and providing them with adequate facilities as well as appropriate information and education programs.

Hanging Rock has provided wheelchair access to the Upper Cascades Waterfall. The park staff is currently investigating the potential for also making a scenic outcrop accessible. This project should be given priority in the state park system's efforts to address Americans with Disabilities Act (ADA) requirements because of Hanging Rock State Park's popularity. Accessible cabins must also be provided with the cabin expansion.

- The increasing cosmopolitan and educated segment of the North Carolina population participates in outdoor recreation more frequently, usually on weekends and close to home. This pattern creates a demand for higher quality leisure delivery systems near population centers. College graduates participate in the following natural-resource oriented activities at a rate double that of non-graduates: backpacking, day hiking, and cross-country skiing.
- As two-wage earner families become more common and urban lifestyles predominate, these families will have less time to plan leisure outings. Better information systems on state parks will help increase public awareness of park opportunities available and reduce public frustration in accessing park resources. Improved brochures, exhibits, signs, increased ranger positions, and interpretative programming are critical needs at Hanging Rock State Park.
- Most, if not all, emerging social groups will expect more and better services at state park units, such as exhibits, brochures, decent toilets, and visitor centers.
- State park attendance, particularly at attractive parks near large urban areas, will continue to grow because of the trend toward frequent trips to nearby parks for one-day or weekend visits. Hanging Rock visitation should continue to experience increased visitation from the population centers along the I-85/I-40 interstate highway corridors.

Popular facilities, such as picnic sites, campsites, trails, and the swimming area, will need to be designed to accommodate the intensive visitor use these facilities will continue to receive. Protection of significant natural resources, aesthetics that are consonant with existing park facilities, and the use of natural materials from the local area should be priorities in these improvements.

- The state parks system should experience a continued demand for dispersed use opportunities, which are threatened by greater visitation, encroaching development, and environmental degradation. The backcountry area within Hanging Rock State Park should continue to be managed to provide high-quality primitive experiences. Activities, such as rock climbing, that may significantly impact natural resources should be

addressed cooperatively by the Division's Natural Resources Section and the park staff.

- The growing number of service sector jobs, which are relatively lower paying, will create an economic class limited in its ability to afford private and commercial recreation opportunities. Public parks will have an important role in providing inexpensive recreation opportunities. Group picnic areas, preferably separated from individual sites, are needed to accommodate groups as well as outdoor interpretive programs.
- Bicycling is the second fastest-growing recreational activity in the United States, and more park visitors will be bringing bicycles to the parks. State parks are logical camping areas and attractions for the bicyclists following the tour biking routes identified by the Department of Transportation Bicycling Highways Program. Bike parking and storage facilities will make state parks more attractive. Mountain bicycling, however, is not appropriate at Hanging Rock because of the severe slopes.
- The influence of the environmental lobby will increase as a result of increased public attention focused on problems such as air pollution, acid rain, changing climate patterns, droughts, and accelerating development. Donations and memberships in environmental organizations have been steadily increasing and expanding the base of support for action on environmental issues. These environmental problems do not have short-term solutions and will continue to generate public concern and support for government action.
- The elderly are potentially the most influential interest group in the 21st century. Their growing numbers, education and organization as well as their voting and spending power will be dominant factors in public decisions. The expectations for park and recreation areas and facilities will be for improved quality, accessibility, and safety. Responding to these expectations and developing an elderly constituency will be advantageous.

The proposed visitor center will be universally accessible and thus serve people with limited mobility. The visitor center should feature high quality exhibits based on the park's interpretive themes as well as programs suitable for large groups such as bus tours. The visitor center could also provide a broader range of programs including arts and craft shows. Retired persons with more flexible schedules can attend at less crowded, off-peak times such as weekdays.

V. SUMMARY OF LAWS GUIDING PARK MANAGEMENT

There are many federal and state statutes, state and federal executive orders, and administrative rules and policies that govern the operation of the state parks system. This chapter includes a brief discussion of the primary legal basis for the existence and operation of the state parks system.

STATE LEGAL MANDATES

NORTH CAROLINA CONSTITUTION

Article XIV, Section 5 of the North Carolina Constitution sets overall policy by broadly defining the conservation and protection of natural resources and the acquisition of such resources as a proper function of government. The amendment reads in part as follows:

It shall be the policy of this State to conserve and protect its lands and waters for the benefit of all its citizenry, and to this end it shall be a proper function of the State of North Carolina and its political subdivision to acquire and preserve park, recreation, and scenic areas, to control and limit the pollution of our air and water, to control excessive noise, and in every other appropriate way to preserve as a part of the common heritage of this state its forests, wetlands, estuaries, beaches, historical sites, open land, and places of beauty.

STATE PARKS ACT

The State Parks Act (G.S. 113-44.7 through 113-44.14) sets forth a mission statement for the state parks system. It states that the system functions to preserve and manage representative examples of significant biologic, geologic, scenic, archaeologic, and recreational resources, and that park lands are to be used by the people of the state and their visitors and descendants in order to promote understanding of and pride in the state's natural heritage.

The State Parks Act also calls for development and periodic revisions of a System Plan to achieve the mission and purpose of the state parks system in a reasonable, timely, and cost-efficient manner. The Act describes System Plan components and requires that public participation be a component of plan development and revisions.

The State Parks Act also calls for the classification of park

resources and development of general management plans (GMPs) for each park. GMPs are to include a statement of park purpose, an analysis of major resources and facilities, and a statement of management direction.

POWERS AND DUTIES OF THE DEPARTMENT OF ENVIRONMENT, HEALTH, AND NATURAL RESOURCES

This act authorizes the Department to make investigations of the resources of the state and to take such measures as it may deem best suited to promote the conservation and development of such resources. The Act also authorizes the Department to care for state forests and parks and other recreational areas now owned, or to be acquired by, the state. (G.S. 113-8)

STATE NATURE AND HISTORIC PRESERVE DEDICATION ACT

The General Assembly in 1973 passed the State Nature and Historic Preserve Dedication Act to "prescribe the conditions and procedures under which properties may be specifically dedicated for the purposes enumerated by Article 14, Section 5 of the North Carolina Constitution (Conservation of Natural Resources)" (G.S. 143-260.6 to 143-260.10). A three-fifths majority of the General Assembly is required to add or remove land from a state nature and historic preserve. Hanging Rock State Park is a component of the State Nature and Historic Preserve.

NORTH CAROLINA ENVIRONMENTAL POLICY ACT OF 1971

Recognizing the profound influence that man's activity has on the natural environment, the General Assembly passed the Environmental Policy Act "to assure that an environment of high quality will be maintained for the health and well-being of all..."

The Act declares that:

It shall be the continuing policy of the State of North Carolina to conserve and protect its natural resources and to create and maintain conditions under which man and nature can exist in productive harmony. Further, it shall be the policy of the State to seek, for all its citizens safe, healthful, productive, and aesthetically pleasing surroundings; to attain the widest possible range of beneficial uses of the environment without degradation, risk to health or safety; and to preserve the important historic and cultural elements of our common inheritance. (G.S. 113A-3)

While there are other General Statutes that concern the state parks system and the environment, the above-described statutes, along with Article XIV, Section 5, of the North Carolina Constitution, largely define the purposes of the state parks system and serve to guide the operation of state park system units.

FEDERAL LAWS

LAND AND WATER CONSERVATION FUND ACT OF 1965

The federal Land and Water Conservation Fund Act (PL 88-578) offers protection and places restrictions on fund-assisted outdoor recreation areas.

By virtue of receiving Land and Water Conservation Fund (LWCF) grant assistance, most of the state parks system, including all of Hanging Rock State Park, is subject to LWCF rules and regulations. Property acquired or developed in whole or in part with LWCF assistance cannot be converted to other than public outdoor recreation use without federal approval. A conversion may only take place if approved by the secretary of the Interior, and only then if replacement property of equal fair market value and reasonably equivalent usefulness and location is made.

LWCF requirements include: programming, operating and maintaining areas in a manner that encourages public participation; maintaining the property so it appears attractive and inviting to the public; maintaining property, facilities and equipment to provide for public safety; keeping facilities, roads, trails and other improvements in reasonable repair throughout their lifetime to prevent undue deterioration and encourage public use; keeping the park and facilities open for use at reasonable hours and times; and making future development meet LWCF rules and regulations. LWCF-assisted sites are periodically inspected by state and federal inspectors to ensure compliance with LWCF requirements.

AMERICANS WITH DISABILITIES ACT

New Construction and Alterations

"...buildings that are constructed or altered by, on behalf of, or for the use of a public entity shall be designed, constructed, or altered to be readily accessible to and usable by individuals with disabilities." (Section 35.151 of Title II)

Existing Facilities

"... structural changes in existing facilities are required only when there is no other feasible way to make the public entity's program accessible" ("structural changes" include all physical changes to a facility). (28 CFR Part 35, Section 35.150, Title II of the ADA). When alterations affect access to a primary function of a facility, the entity shall also make alterations to the path of travel to the area and bathrooms, public telephones, and drinking fountains serving the altered area.

Programs and Services

"... each service, program, or activity conducted by a public entity, when viewed in its entirety, be readily accessible to and usable by individuals with disabilities." (Title II, Section 35.150)

This includes, but is not limited to, the provision of auxiliary aids and services, including services and devices for effective communication (making orally and visually delivered materials available to persons with disabilities) where necessary to afford persons with disabilities an equal opportunity to participate in and enjoy the benefits of a service, program, or activity conducted by a public entity.

Signs

A public entity must ensure that persons with impaired vision and hearing can obtain information regarding the location of accessible services, activities, and facilities. Signs must be provided at all inaccessible entrances to each facility directing users to an accessible entrance or to a location where information can be obtained about accessible facilities. The international symbol for accessibility must be used at each accessible entrance to a facility. (Title II, Section 35.163)

STATE POLICIES

STATE PARKS SYSTEM MISSION STATEMENT

The North Carolina state parks system exists for the enjoyment, education, health and inspiration of all our citizens and visitors. The mission of the state parks system is to conserve and protect representative examples of the natural beauty, ecological features and recreation resources of statewide significance; to provide outdoor recreation opportunities in a safe and healthy environment; and to provide environmental educational opportunities that promote stewardship of the state's natural heritage.

While the mission statement itself has no legal authority, it was written to concisely express the purposes for which the system exists. These purposes are legally mandated by many sources, including the North Carolina Constitution and state statutes, some of which have been highlighted above.

HANGING ROCK STATE PARK MASTER PLAN

The master plan is to serve as a guide for development and management of park resources. It includes an analysis of cultural and natural resources as well as site analysis and development recommendations.

The master plan was developed with two primary objectives in mind: preserving and protecting the park's natural condition and character; and establishing a recreation program that provides an opportunity for public enjoyment of the park.

Action: During the general management plan process, the draft master plan, which needed only to be approved by the secretary of the Department of Environment, Health, and Natural Resources, was reviewed to determine if development proposals were still valid. The GMP evaluation determined that the master plan development is still appropriate and should be approved by the secretary with the changes described in chapter VII and VIII of this document.

VI. NATURAL AND CULTURAL RESOURCE MANAGEMENT

NATURAL RESOURCE MANAGEMENT POLICY

The Division of Parks and Recreation's approach to natural resource management is directed by the North Carolina Constitution and the State Parks Act, both of which require the management of natural resources. The constitution sets overall policy by broadly defining the conservation and protection of natural resources and the acquisition of such resources as a proper function of government. The State Parks Act states that unique archaeological, geological, biological, scenic, and recreational resources are a part of the heritage of the people, which "...should be preserved and managed by those people for their use and for the use of their visitors and descendants."

The North Carolina State Parks System plays an important role in maintaining, rehabilitating, and perpetuating the state's natural heritage. The natural resources of the state parks system are: high quality, rare or representative examples of natural communities; native plants and animals; geological features and landforms; water resources; and the natural processes that affect these elements. The primary objective in natural resource management will be the protection of natural resources for their inherent integrity and for appropriate types of enjoyment while ensuring their availability to future generations.

It is the policy of the Division that natural resources will be managed by allowing natural environments to evolve through natural processes with minimal influence from human activities. Resource management will not attempt solely to preserve individual species or individual process; rather, it will try to maintain all the components and processes of naturally evolving ecosystems. When intervention is necessary, direct or secondary effects on park resources will be minimized to the greatest extent possible. Intervention with natural processes may occur:

- 1) to correct or compensate for the disruption of natural processes caused by human activities;
- 2) to protect, restore, or enhance rare species;
- 3) to protect, restore, or enhance significant archaeological resources;
- 4) to construct, maintain, improve, or protect park facilities; and
- 5) to prevent danger to human health and safety.

NATURAL COMMUNITIES

These descriptions follow the Classification of the Natural Communities of North Carolina: Third Approximation (Schafale and Weakley, 1990).

SPRAY CLIFF

This community type occurs on gently sloping to vertical rock faces that have waterfalls. The local humidity is very high and the moisture supply is essentially constant as a consequence of seepage and the spraying action of the waterfall. The steep terrain is usually too rocky and wet to support a closed tree canopy, and the vegetation is a variable collection of mosses, ferns, liverworts, and vascular herbs and shrubs, many of them requiring constantly moist substrates and high humidities. These communities are unusually stable and equitable; successional processes are usually slower than normal and extremes in temperatures are rare.

This community is found most often in western North Carolina in gorges associated with the Blue Ridge Escarpment; well developed examples are rarely encountered in the Piedmont. Good examples occur at the Lower Cascade Falls (elev. 1,000 ft.) and Upper Cascade Falls (elev. 1,550 ft.) in the Cascade Creek Registered Natural Heritage Area. These sites are significant in that they support a wide variety of mosses and liverworts more typically associated with mountain ecosystems. Some trampling has occurred around the falls at both sites; however, most of the area at either site is inaccessible and is largely undisturbed.

CAROLINA HEMLOCK BLUFF

This community occurs on steep, exposed bluffs and gorges within the park and is frequently interspersed with Chestnut Oak Forest communities. The canopy is well developed, with Carolina hemlock (Tsuga caroliniana) as the dominant canopy species; chestnut oak (Quercus prinus) and red maple (Acer rubrum) are also common canopy species. The shrub layer is typically a dense layer of heaths dominated by mountain rosebay (Rhododendron catawbiense) and mountain laurel (Kalmia latifolia). Although this community occurs throughout the Blue Ridge, examples in the Piedmont are uncommon and are highly significant, disjunct communities. Well developed examples of this community are found on Moore's Wall in the Moore's Knob-Cook's Wall Registered Natural Heritage Area (elev. 2,300 ft.), along Cascade Creek in the Cascade Creek Registered Natural Heritage Area (elev. 1,400 ft.), and along Indian Creek (elev. 1,400 ft.). The communities in the gorges along Cascade and Indian creeks are particularly notable in that this community type occurs only rarely in small creek gorges at low elevations. All of these sites have suffered from local trampling; however, due to the steepness of the terrain, they are largely inaccessible and undisturbed.

PINE-OAK/HEATH

This community type is common in the Blue Ridge Mountains and generally occurs below 4,000 feet on exposed, sharp ridges and steep south facing slopes. The vegetation is diverse, with a relatively open canopy and a dense shrub layer. This community occurs within the park on Moore's Wall and Cook's Wall (elev. 2,500 ft.) in the Moore's Knob-Cook's Wall Registered Natural Heritage Area, and on Hanging Rock (elev. 2,200 ft.) in the Hanging Rock Registered Natural Heritage Area. The canopy at all three sites is dominated by pitch pine (Pinus rigida), Virginia pine (P. virginiana), and table mountain pine (P. pungens). Common understory species include mountain laurel, black huckleberry (Gaylussacia baccata), blueberry (Vaccinium spp.), and bear oak (Quercus ilicifolia), a rare, disjunct species. These Pine-Oak/Heaths are similar to those found in the Blue Ridge Mountains but are significant for their disjunct Piedmont location.

CHESTNUT OAK FOREST

This forest type normally occurs on slopes and ridgetops at elevations up to 4,000 feet. This is the most abundant forest type in the park and the presence of numerous disjunct mountain species makes this community significant. The best and largest example of this community occurs in the Moore's Knob-Cook's Wall Registered Natural Heritage Area between the ridges of Moore's Wall and Cook's Wall (elev. 2,100 ft.). The canopy is generally closed and is dominated by chestnut oak, with Virginia pine, red maple, black gum (Nyssa sylvatica), and sourwood (Oxydendrum arboreum) common in the subcanopy. The shrub layer is usually dense and is typically dominated by mountain laurel, blueberry, and other heaths. Stand quality varies from excellent mature forest, with trees up to 16" in diameter, to young, second-growth stands. A second, younger example of this community in the Moore's Knob-Cook's Wall Registered Natural Heritage Area occurs near Huckleberry Ridge and Ruben Mountain. Extensive areas of this community are in good condition and show little impact from overuse.

DRY OAK-HICKORY FOREST

This community type is found throughout the Piedmont on ridgetops, steep, south-facing slopes, and deep sheltered ravines. The canopy is dominated by dry-site oaks, usually chestnut oak, white oak (Q. alba), black oak (Q. velutina), and various hickory species, including mockernut (Carya tomentosa), sweet pignut (C. ovalis), and pignut (C. glabra). Red maple and sourwood are common subcanopy species. These forests were once one of the predominant community types in the Piedmont. Most of their range have been subjected to intensive agricultural use and urbanization, and although these forests are still relatively common, protected examples of significant size are rare. This community type occurs

in the Moore's Knob-Cook's Wall Registered Natural Heritage Area in the low area between Moore's Knob and Cook's Wall (elev. 1,900 ft.). Although the extent of the forest in the park is not known, it appears to be in good condition and is considered to be significant due to the presence of a number of disjunct species that normally have affinities for more mountainous areas.

LOW ELEVATION ROCKY SUMMIT

This community type is rare in the Piedmont and is confined to the highest monadnocks, which are fractured formations composed of resistant rock that rise above the surrounding landscape, often abruptly. Elevation is generally below 4,000 feet, and vegetation may be interspersed with substantial areas of bare rock. A closed tree or shrub canopy is frequently absent. This community occurs on the park's steep south-facing quartzite cliffs ranging in elevation from 2,000 to 2,500 feet. Excellent examples can be found at Hanging Rock Knob in the Hanging Rock Registered Natural Heritage Area and at Cook's Wall, Devil's Chimney, House Rock, and the summits of Huckleberry Ridge and Moore's Wall in the Moore's Knob-Cook's Wall Registered Natural Heritage Area. Ruben Mountain and Wolf Rock, neither of which is located in a registered natural heritage area, also support examples of this community.

Canopy species are scattered at each of these sites and include chestnut oak, Carolina hemlock, and Virginia pine. Shrub species rooted in rocky cracks and crevices dominate much of these areas and include mountain laurel, mountain rosebay, black huckleberry, and bear oak. Other species common to these outcrops include St. John's wort (Hypericum spp.), sandworts (Arenaria spp.), oat grass (Danthonia spp.), and ferns (Polypodium spp.). Accessible areas in the communities at Moore's Wall and Hanging Rock have lost much of their herbaceous vegetation to heavy trampling. This is of particular concern at Moore's Wall, where bear oak, a rare species that is a major component of the woody vegetation, has been damaged by climbers and hikers. The communities at Cook's Wall, Devil's Chimney, House Rock, Wolf Rock, and Huckleberry Ridge have also suffered from some trampling, but are well developed, generally inaccessible, and largely undisturbed.

MONTANE ACIDIC CLIFF

This community, like the Low Elevation Rocky Summit community, is rare in the Piedmont. It is distinguished from the Low Elevation Rocky Summit community by occurring on lower altitude, more sheltered sites. Scattered woody species produce an open habitat lacking a substantial canopy, and the best developed examples are dominated by bare rock. This community occurs at elevations ranging from 1,000 to 1,600 feet within the park and is confined to steep quartzite cliffs. Well developed examples occur at the Lower and Upper Cascade Falls in the Cascade Creek Registered Natural

Heritage Area; a third example occurs in the Tory's Falls-Tory's Den area. These communities are significant in that they represent Piedmont disjuncts of a montane community type. Canopy species at all of these sites are scattered and include Virginia pine, chestnut oak, Carolina hemlock, and pitch pine. Understory vegetation is generally limited to shrubby species growing in pockets and crevices and includes mountain laurel, great laurel (Rhododendron maximum), blueberry (Vaccinium vacillans), trailing arbutus (Epigaea repens), and sand myrtle (Leiophyllum spp.). Each of these sites has suffered from trampling (especially at the Upper Cascade Falls); however, most of the area at these sites is steep and has suffered little disturbance.

NATURAL HERITAGE PROGRAM ELEMENT OCCURRENCES

BROWN ELFEN (Incisalia augustus)

Although there is a record of this butterfly for the park from as recently as 1988, the data are insufficient for a precise assessment, so its status is listed as Unknown. It is known to favor dry areas with an abundance of ericaceous species.

WEHRLE'S SALAMANDER (Plethodon wehrlei)

This salamander has been designated by the Wildlife Resources Commission as Threatened in North Carolina and is considered likely to become endangered. The most recent record for the species dates from 1978, when a specimen was collected in a chestnut oak forest just northeast of Hanging Rock knob. The park is the only known location of this species in the state.

COMMON RAVEN (Corvus corax)

This species has been assigned Significantly Rare status, meaning that while it is neither threatened nor endangered, it has been determined to require monitoring. Park staff report frequent sightings of these birds in the park, especially along Hanging Rock ridge and Moore's Wall. The cliffs at Moore's and Cook's Walls provide suitable nesting habitat and park staff documented a nest at Moore's Wall as recently as 1991.

TRANSLUCENT ORTHODONTIUM (Orthodontium pellucens)

This moss has been assigned Candidate status for state listing as a protected species, meaning that it may become threatened or endangered as a consequence of low numbers, habitat loss, or limited distribution. It occurs in areas with moist, calcareous rock substrates; the most recent record is from 1975, when it was collected from the base of cliffs near Hanging Rock Knob.

SMALL RABBIT TOBACCO (Gnaphalium helleri var. micradenium)

This plant has been assigned Significantly Rare status. Although it is known to occur in dry woodlands, the most recent record is vague and dates from 1965, when it was found on "wooded slopes."

GREENLAND SANDWORT (Minuartia groenlandica)

This plant has been assigned Candidate status. It is common in Low Elevation Rocky Summit habitat and was reported from Moore's Knob in 1975.

SCHWEINITZ'S SUNFLOWER (Helianthus schweinitzii)

This plant has been assigned Endangered status at both the state and federal levels, meaning that its continued existence is in jeopardy. It inhabits open woods and the most recent confirmed record for the park is 1948, when it was found in chestnut oak forests along the ridge leading to Hanging Rock Knob. A search in 1987 was unsuccessful but was apparently undertaken too early in the season for the plant to be readily apparent.

SWEET PINESAP (Monotropsis odorata)

This species has been assigned Candidate status. It was reported from the park in 1987, when it was found in upland hardwood forests, and again in 1992, when a large population was found beneath an oak forest near the Hanging Rock trail.

ASH-LEAVED GOLDEN BANNER (Thermopsis fraxinifolia)

This plant has been assigned Candidate status. It was last reported from the park in 1974, when it was collected from the banks of Indian Creek, upstream from Hidden Falls and Window Falls.

BEAR OAK (Quercus ilicifolia)

This small shrubby species has been assigned Significantly Rare status. It is particularly abundant in open, southeast facing chestnut oak-Virginia pine communities southwest of the tower on the ridge of Moore's Wall. It is believed that the most extensive population of bear oak in the state occurs at Moore's Wall.

LARGE WITCH ALDER (Fothergilla major)

This plant has been assigned Candidate status. It has been reported and collected from several locations in the park: in 1950 on wooded slopes near the park entrance; in 1966 along the trail to Moore's Knob; and in 1992 near the Upper Cascade Falls.

WHITE-LEAVED LEATHERFLOWER (Clematis glaucophylla)

This plant has Significantly Rare status. It favors wooded habitats and although it appears on a checklist for Hanging Rock State Park, there is no information on the habitat or location of the plant in the park.

BRADLEY'S SPLEENWORT (Asplenium bradleyi)

This plant has been assigned Candidate status. The most recent record of this species dates from 1980, when it was found in the Tory's Den area growing on a mica-schist outcrop.

REGISTERED NATURAL HERITAGE AREAS

MOORE'S KNOB-COOK'S WALL REGISTERED NATURAL HERITAGE AREA

This area encompasses 390 acres and includes the vertical quartzite ridges and monadnocks found at Moore's Wall and Cook's Wall (Figure VI-1). These ridges form spectacular escarpments of exposed quartzite that rise more than 200 feet above the surrounding area. Other significant natural resources in the area include the substantial bear oak population at Moore's Wall, and the presence at Cook's Wall of itacolumite, a very rare flexible sandstone.

This area supports several high quality communities that are more typical of the Mountain region than the Piedmont and features numerous disjunct plant species. Although the vegetation in this area is largely undisturbed, and in many places inaccessible, losses from trampling have occurred. Also, rock climbing on Moore's Wall is very popular, and there are concerns over its effects on sensitive Low Elevation Rocky Summit vegetation, particularly the bear oak populations along the ridge. Climbing could also disturb nesting ravens. Management considerations should include trail maintenance and erosion control, and climbing activity should be monitored closely for adverse impacts.

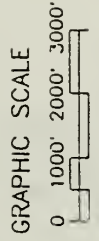
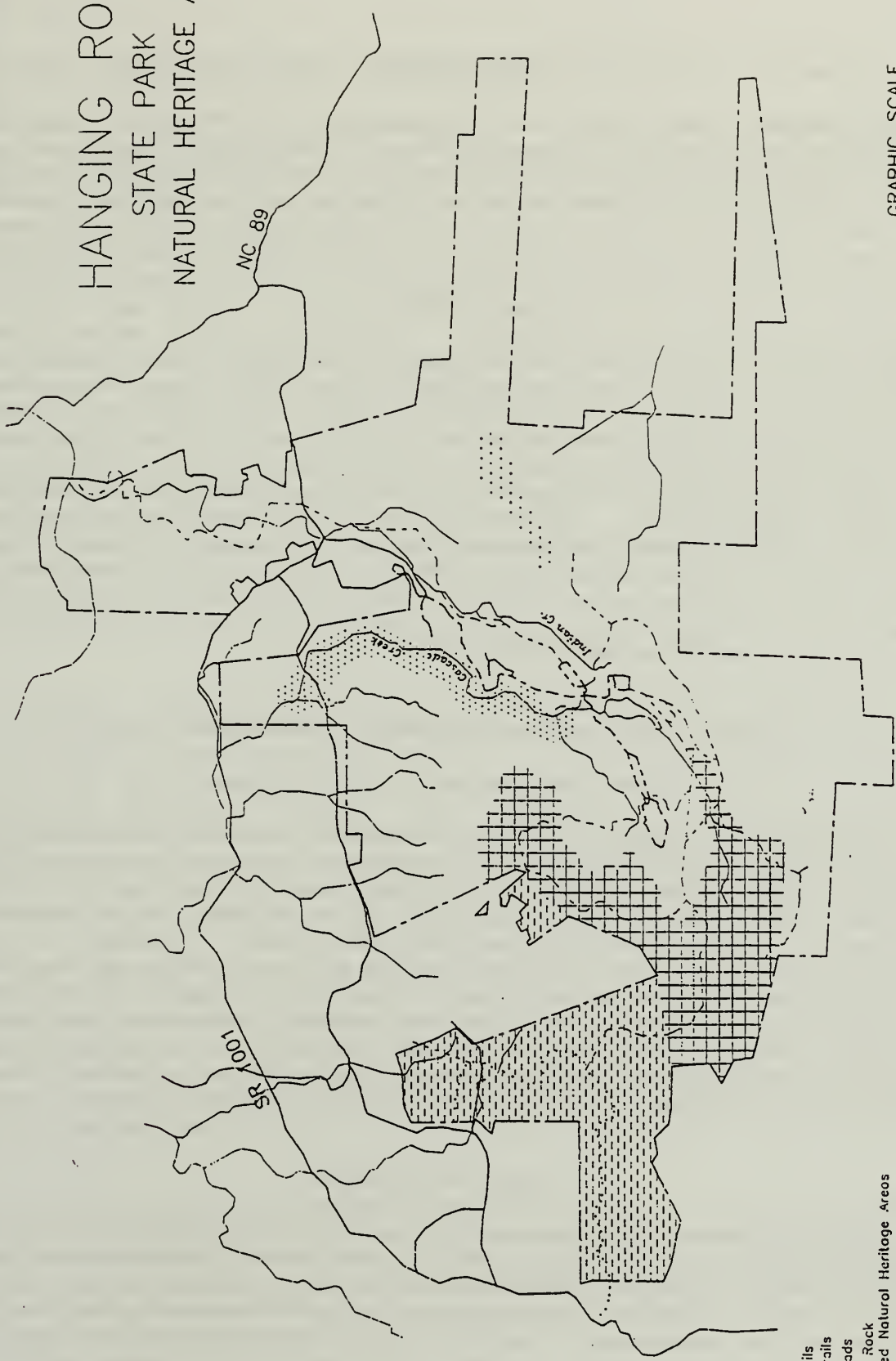
CASCADE CREEK REGISTERED NATURAL HERITAGE AREA

This area covers 120 acres and features a two mile long gorge. Its unique features include a dramatic contrast in soil and habitat types that results in the rare occurrence of Carolina and Canadian hemlock growing side by side. The area supports several disjunct communities more commonly associated with mountainous ecosystems and includes particularly well developed Spray Cliff and Carolina Hemlock Bluff communities. Although the general area receives limited use, the waterfalls at either end of the gorge (the Lower and Upper Cascade Falls) receive substantial visitation, and trampling and erosion are severe at those areas.

HANGING ROCK REGISTERED NATURAL HERITAGE AREA

This area covers 55 acres and includes the quartzite monadnock from which the park takes its name. This area supports high quality, disjunct examples of montane communities and species and is the only site in North Carolina where the rare Wehrle's salamander is known to occur. Sightings of ravens above Hanging Rock ridge are quite common. Hanging Rock is an extremely popular hiking destination for visitors and offers sweeping panoramic views of the Piedmont and the nearby Sauratown and Blue Ridge mountains. Heavy use has caused extreme problems with trail erosion, compaction, and vegetation loss from trampling.

HANGING ROCK
STATE PARK
NATURAL HERITAGE AREAS



LEGEND

- Foot Trails
- Horse Trails
- Park Roads
- Hanging Rock Registered Natural Heritage Areas
- Cascade Creek Registered Natural Heritage Areas
- Moore's Knob/Cook's Wall Registered Natural Heritage Areas
- Proposed Additions to Registered Natural Heritage Areas

Figure VI-1. Natural Heritage Areas.

POTENTIAL ADDITIONS TO REGISTERED NATURAL HERITAGE AREAS

Consideration should be given to expanding the Moore's Knob-Cook's Wall Registered Natural Heritage Area to include the area around Ruben Mountain, Tory's Den and Tory's Falls, and the cliffs on Moore's Wall. The Ruben Mountain-Tory's Den areas were added to the park after the initial area designation and so were not included in it. The face of Moore's Wall supports some of the most extensive and well developed Low Elevation Rocky Summit communities in the Piedmont. This area also supports other well developed examples of several community types that are more commonly associated with the mountains than the Piedmont and includes the Chestnut Oak Forest on Huckleberry Ridge and Ruben Mountain, the Low Elevation Rocky Summit community at Ruben Mountain, and the Montane Acidic Cliff community at Tory's Den. This area would be a valuable extension of the existing natural area at Moore's Knob and Cook's Wall and would provide protection for more of the park's disjunct communities. The extensive cliff communities at Moore's Wall are largely inaccessible and so would probably remain largely undisturbed. Also, since there are only two trails into the Ruben Mountain-Tory's Den area, visitor use and impacts would probably remain low, meaning that the area would likely be retained in an essentially undisturbed condition.

CULTURAL AND NATURAL RESOURCE MANAGEMENT ISSUES

NATURAL RESOURCE INVENTORIES

A comprehensive, updated natural heritage survey is needed for the entire park. These inventories would provide the baseline data for a natural resources monitoring program and could also provide for expanded interpretation and education programs. Given the age of the park's current natural heritage data base, emphasis should be placed on locating and determining the status of the species listed in the Element Occurrence files. Species of particular interest are the common raven (assessment of nesting locations and breeding success), Wehrle's salamander (confirmation of its presence and the population's status), and bear oak (monitoring population health and size and assessing impacts from hikers and climbers).

VISTA MANAGEMENT

Although unobstructed views of the nearby Blue Ridge Mountains and Piedmont are a primary objective for the park, no wholesale cutting should occur to improve the view from any vantage point, particularly if such cutting requires the loss of numerous, mature trees. Future vista management should follow previous vista management practices that have been largely limited to the areas immediately adjacent to park facilities.

FIRE ECOLOGY

Although the park has experienced 10 small fires since 1975, the fire ecology of the Piedmont and Mountain regions of North Carolina is poorly understood, and the park's natural fire regime is largely unknown. Research is needed to determine if the park's natural communities are fire related.

GYPSY MOTH

The gypsy moth (Lymantria dispar) is an exotic insect that is working its way south; park staff are currently monitoring for its presence. Both the moth and efforts to control it have the potential to affect the park's natural communities. In addition to the natural heritage surveys noted above, a comprehensive survey of the park's lepidoptera species is needed to determine the moth's status in the park. If it is present, then updated data will assist staff in selecting those treatment options that will lessen the impacts on the park's other natural resources.

LAKE AND STREAM WATER QUALITY

Currently, the park's lake and streams enjoy excellent water quality, and a section of Cascade Creek has been nominated for Outstanding Water Resource status. In order to ensure the park's continued high water quality, the park staff should attempt to determine optimum visitor use levels in the lake and develop policies designed to protect it from overuse. The lake water quality is impacted by storm drain runoff from the adjacent parking lot. The storm drain runoff, and the pollution that is carried into the lake, should be diverted into the Indian Creek watershed.

Much of the park's trails system is badly washed and sedimentation from trail erosion represents a major threat to stream quality throughout the park. Every effort should be made to stabilize the park's trails. Stabilization along the Hanging Rock and Indian Creek trails is particularly important for the protection of Indian Creek; stabilization of the trails to and around the Lower and Upper Cascade Falls will be necessary to protect water quality in Cascade Creek.

Recent realignment and stabilization of the old alignment along the trail to Hanging Rock should help protect and maintain water quality in Indian Creek. Since other trails may require considerable rehabilitation, resource management staff should be consulted prior to any work in order to safeguard special plant and animal species in these areas.

LAND USE AND EXTERNAL THREATS

Although the park is located in a rural county, development pressures are increasing and staff must be continually alert to the park's management needs. Stokes County has applied to the Mountain Area Planning Program for assistance in protective land-use planning around the park and along the major access routes to the park. Protective planning by the local government will help protect the Dan River corridor, as well as other scenic and natural resources that are beyond the Division's jurisdiction. Local involvement and action in protecting state park resources should be encouraged.

ROCK CLIMBING

Hanging Rock's outstanding quartzite cliffs have made it one of the state's most popular rock climbing sites. Climbing is permitted at Cook's and Moore's Walls, but the majority occurs at Moore's Wall, which is more easily reached and is accessible from private property. Climbing is prohibited on Hanging Rock. Concerns over climbing activity are directed largely toward potential resource management/protection issues regarding fragile plant and animal communities on Moore's Wall, particularly bear oak, Bradley's spleenwort, Greenland sandwort, and nesting sites for the park's ravens.

Although adverse impacts are suspected to be minimal at present, the effects of climbing and what measures should be taken to mitigate them cannot be known until these areas are surveyed and inventoried. If climbing is found to be affecting sensitive species, then consideration should be given to closing those areas that present the greatest concern. Restricted access for the purpose of resource protection has been successfully implemented at Pilot Mountain and Crowders Mountain, and climbers have reacted responsibly. The same can be accomplished, if necessary, at Hanging Rock by making sure that climbers are made aware of the park's conservation needs.

Climbing is confined largely to well identified routes (the park is included in Thomas Kelly's thoroughly documented "Climbers' Guide to North Carolina", and although local climbers are generally responsible, park staff should monitor activity and continue to ban the placement of additional permanent anchors. Pressures from climbing are likely to increase as the sport's popularity grows. The park staff should make every effort to develop positive working relationships with the area's leading climbers and enlist their help in enforcing regulations and ethics. This has been done at Crowders Mountain and has worked to the park's great benefit.

RESOURCE MANAGEMENT PLAN

A comprehensive, park-specific resource management plan addressing these and future resource management issues should be developed. This plan should include detailed actions whose implementation will prevent or correct threats or damage to significant natural resources. The addition of district resource management specialists, one for each district, would facilitate the implementation of this plan.

VII. PHYSICAL PLANT INVENTORY

FACILITY INVENTORY AND INSPECTION PROGRAM

The buildings in state parks are needed for park operations and visitor services. These buildings and facilities are essential components of protecting the public's health and safety. They include facilities providing safe drinking water, restrooms, and electricity, as well as recreation facilities such as bathhouses, group camps, and cabins. Without proper maintenance, these facilities are, at best, a disservice to the citizens who use them, and at worst, potentially harmful.

The Facility Inventory and Inspection Program (FIIP) is a computer-based system used to track the condition, maintenance needs, and repair costs of every building in the state parks system. A principal objective of FIIP is to identify deficiencies that may affect health, fire, or life safety. Other objectives are to identify accessibility deficiencies and other significant maintenance-related deficiencies.

During a field evaluation, technicians identify each park building by locating it on a park map and indicating the state property number (Figure VII-1). The most basic information collected for each structure is whether or not it is currently in use (Table VII-1). If repairs are needed to bring the building into compliance with construction codes, the types of repairs and repair costs are listed. Buildings that should be demolished are also indicated and demolition costs are estimated (Table VII-2). Finally, the repair and demolition cost summary for all park structures is given using nine basic categories of repairs (e.g. exterior envelope) and the three levels of deficiencies (Table VII-3).

Table VII-1. Building Inventory.

BUILDING CODE	BUILDING NAME	IN USE
005001	Collins House	N
005002	Pit Toilet	Y
005003	Pit Toilet	Y
005004	Residence	Y
005005	Residence	Y
005006	Residence	Y
005007	Barracks	Y
005008	Office	Y
005009	Residence (demolished)	N
005010	Shop Building	Y
005011	Interpretive Building	Y
005012	Warehouse (demolished)	N
005013	Picnic Shelter	Y
005014	Picnic Shelter	Y
005015	Picnic Shelter	Y
005016	Toilet Building	Y
005017	Toilet Building	Y
005018	Women's Toilet Building	Y
005019	Toilet Building	Y
005020	Upper Washhouse	Y
005021	Lower Washhouse	Y
005022	Chlorinator Building	Y
005023	Cabin No. 1	Y
005024	Cabin No. 2	Y
005025	Cabin No. 3	Y
005026	Cabin No. 4	Y
005027	Cabin No. 5	Y
005028	Cabin No. 6	Y
005029	Bathhouse	Y
005030	Boat House	Y
005031	Open-Faced Shed	Y
005032	Storage Shed	N
005033	Storage Building	Y
005034	Pit Privy	Y
005035	Observation Tower	Y
005036	Tobacco Barn (demolished)	N
005037	Tobacco Barn	N
005038	Abandoned House (demolished)	N
005039	Shed/Barn	N
005040	Abandoned House (demolished)	N
005041	Shed/Barn (demolished)	N
005042	Abandoned House (demolished)	N
005043	Shed/Barn (demolished)	N
005044	Shed (demolished)	N
005045	Shed (demolished)	N
005046	Cabin	N
005047	Well House	N
005048	Shelter	N
005049	Well house near barracks	Y
005050	Superintendent's Residence	Y
005051	Warehouse	Y

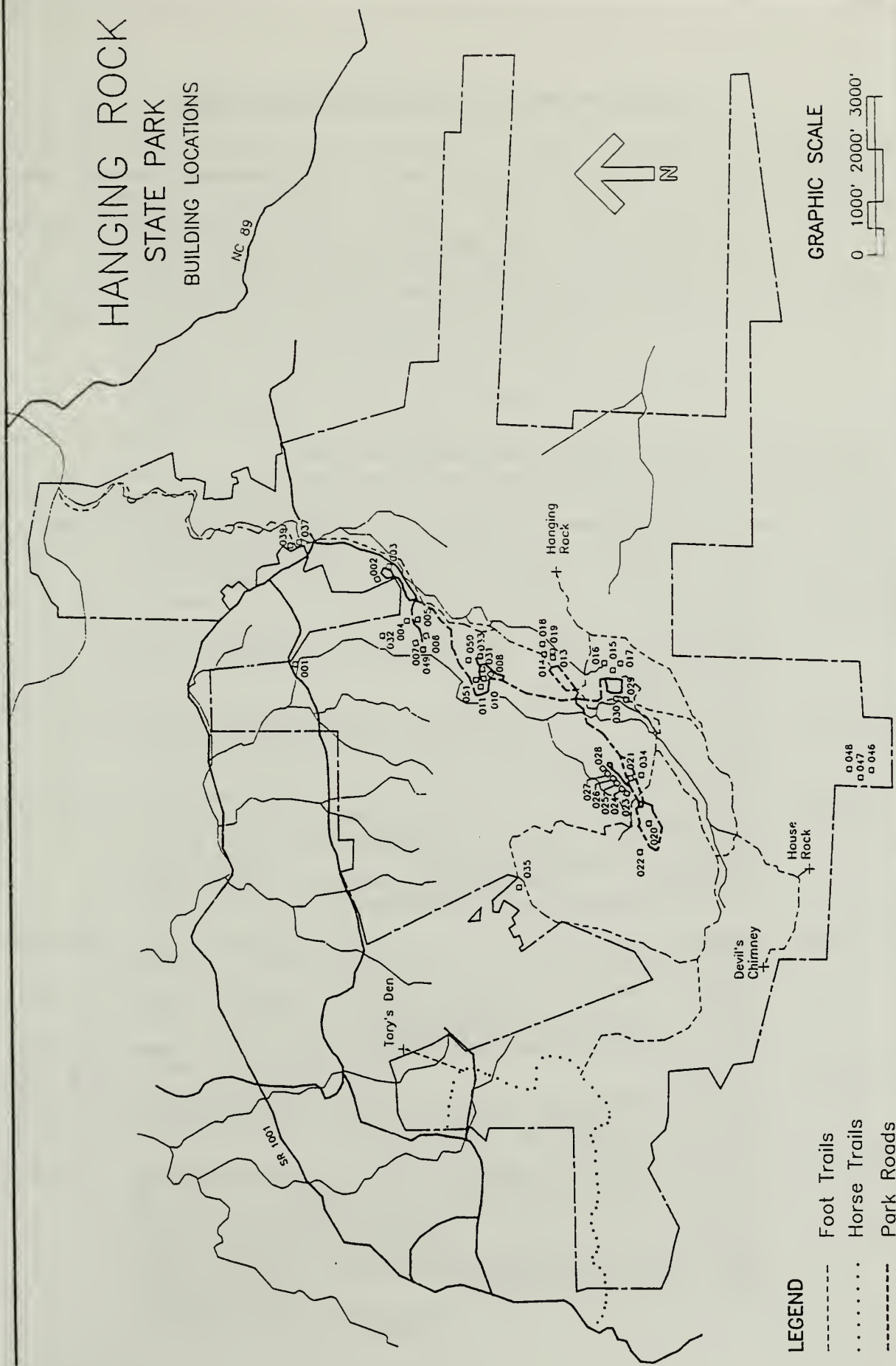


Figure VII-1. Building Locations

FACILITY REPAIR AND DEMOLITION NEEDS

Buildings at Hanging Rock are generally in very good condition. Only four of the 40 buildings currently in use require work costing over \$10,000. The work needed for these four, however, equals nearly 60 percent of the total repair cost estimated for the park. The four buildings are a residence (#006), the office (#008), the upper washhouse (#020), and the bathhouse (#029). Most of the work costs for the remaining buildings are very low, and nine require no repairs. Five structures are scheduled for demolition (Table VII-2).

Figure VII-2. Facility Repair and Demolition Needs.

Bldg#	Building Name/Need	Demolition Cost	Repair Cost
005-001	Collins House	\$ 3,984	
005-002	Pit Toilet		\$ 263
	Reroof		60
	Regrade for drainage away from building		75
	Replace damaged door		128
005-003	Pit Toilet		\$ 135
	Reroof		60
	Regrade for drainage away from building		75
005-004	Residence		\$ 1,131
	Replace missing bricks in entrance steps		117
	Regrade for drainage away from building		422
	Construct concrete entrance walkway		591
005-005	Residence		\$ 2,304
	Replace missing bricks in entrance steps		445
	Replace screening and repaint porch trim		666
	Regrade to clear soil from vents		809
	Level and reset stones in walkway		383
005-006	Residence		\$ 22,868
	Renovate bathroom		2,538
	Replace all windows		2,820
	Insulate floor and all heating ducts		1,502
	Replace range hood		375
	Regrade to clear foundation vents		1,050
	Re-level stones in walkway		267
	Add freeze-proof spigot at front of house		150
	Replace rotting columns		150
	Rebuild porch railing		450
	Repair and repaint rake board		68
	Replace plumbing network		13,500

Table VII-2. Facility Repair and Demolition Needs (Continued).

Bldg#	Building Name/Need	Demolition Cost	Repair Cost
005-007	Barracks		\$ 5,020
	Install electrical receptacles		490
	Replace damaged or missing fixtures and covers		605
	Replace damaged siding, repaint all siding		1,800
	Replace damaged base board and repaint		36
	Construct concrete walkway		627
	Prune dead tree limbs away from building		750
	Regrade for proper drainage; treat for termites		630
	Replace broken window glass		86
005-008	Office		\$ 15,336
	Replace electrical system		8,888
	Add security system		1,500
	Rebuild front porch for HA access		1,769
	Provide HA parking and access to front door		1,569
	Remove tree causing foundation damage		1,500
	Increase size of attic access opening		110
005-013	Picnic Shelter		\$ 185
	Trim overhanging branches		75
	Stain siding		110
005-014	Picnic Shelter		\$ 2,505
	Replace damaged siding, re-stain all		1,605
	Replace damaged post and rails and stain to match		900
005-015	Picnic Shelter		\$ 1,128
	Re-anchor timber steps; fill and level gravel path		1,319
	Replace and stain damaged post, rails and siding		710
	Regrade site to direct drainage away from stairs and building		420
005-016	Toilet Building		\$ 113
	Repair or rebuild door		
005-017	Toilet Building		\$ 113
	Repair or rebuild vandalized door		
005-018	Women's Toilet Building		\$ 1,475
	Replace toilet partitions		
005-019	Toilet Building		\$ 300
	Add diversion ditch at each water bar in path		
005-020	Upper Washhouse		\$ 15,456
	Replace 3 columns		180
	Re-roof, add chimney cap		2,025
	Scrape and repaint building		1,050
	Replace ventilation system		2,700
	Replace laundry sinks and faucets		480
	Replace lights above lavatories with fluorescent		318
	Recaulk exterior window trim		60
	Add ceramic tile in showers		8,643

Table VII-2. Facility Repair and Demolition Needs (Continued).

Bldg#	Building Name/Need	Demolition Cost	Repair Cost
005-021	Lower Washhouse Replace window screen Replace and paint siding Add door closers and pull handles Add chimney cap		\$ 5,738 75 4,898 540 225
005-022	Chlorinator Building Replace attic access door Replace roof shingles on south side of building Tuck point mortar joints Patch interior stucco walls		\$ 449 113 186 90 60
005-023	Cabin #1 Provide HA parking and entry path Relocate and widen bedroom doors Relocate bathroom wall and provide HA fixtures Remove dead or overhanging tree limbs		\$ 5,346 1,988 927 2,330 101
005-024	Cabin #2 Patch roof leak Rebuild warped door Replace damaged floor tile Replace damaged wood wall paneling, refinish Trim overhanging tree limbs		\$ 512 113 113 36 150 101
005-025	Cabin #3 Trim overhanging tree limbs		\$ 101
005-026	Cabin #4 Rebuild warped door Replace damaged wood wall paneling, refinish Trim overhanging tree limbs		\$ 364 113 150 101
005-027	Cabin #5 Trim dead or overhanging tree limbs		\$ 101
005-029	Bathhouse Install larger electrical panel, add directory Take up loose stone path and reset in mortar bed Repoint chimney mortar and loose stones in wall Replace toilet partitions Replace damaged siding, restrain all siding Trim overhanging tree limbs		\$ 19,279 1,290 8,250 2,150 7,103 387 101
005-030	Boat House Trim overhanging tree limbs Regrade for clearance from siding and provide swale Add gravel and repair path		\$ 775 101 270 404
005-031	Open Faced Shed Rewire shed Replace roofing		\$ 1,883 683 1,200
005-032	Storage Shed	\$ 126	

Table VII-2. Facility Repair and Demolition Needs (Continued).

Bldg#	Building Name/Need	Demolition Cost	Repair Cost
005-033	Storage Building		\$ 270
	Repaint roof		120
	Remove tree that is damaging wall		150
005-034	Pit Privy		\$ 75
	Replace damaged wood		
005-037	Tobacco Barn	\$ 3,600	
005-046	Cabin	\$ 1,637	
005-047	Well House	\$ 1,000	
005-048	Shelter	\$ 300	
TOTALS		\$ 10,647	\$ 103,225

FACILITY REPAIR AND DEMOLITION COST SUMMARY

Table VII-3. Facility Repair and Demolition Cost Summary.

DEFICIENCY CATEGORY	CRITICAL	SERIOUS	MINOR	CATEGORY SUBTOTAL
SITE	\$ 0	\$ 13,945	\$ 6,355	\$20,300
EXTERIOR ENVELOPE	565	22,670	9,423	32,657
INTERIOR ENVELOPE	0	8,438	10,638	19,076
FIRE/LIFE SAFETY	0	1,500	60	1,560
HANDICAPPED ACCESS	0	8,584	0	8,584
PUBLIC HEALTH	0	0	0	0
HEATING, VENTILATION, AND AIR CONDITIONING	0	3,412	225	3,637
PLUMBING/UTILITY	0	480	15,270	15,750
ELECTRICAL	1,245	10,730	333	12,307
TOTALS	\$ 1,809	\$ 69,757	\$42,304	\$113,871

Deficiencies that are a threat to fire and life safety or the health of an individual are considered to be "critical." A "serious" deficiency is one that is not considered a threat to fire and life safety, but which could cause further damage to the structure if left uncorrected. This category usually includes building code violations. "Minor" deficiencies are those requiring general maintenance and repair.

ROAD AND UTILITY INVENTORY

This survey gives a brief description of the park infrastructure (roads, water, sewer, electrical, and telephone) and makes general recommendations on upgrading and maintaining these systems. The information is based on a two-day park inspection of the park facilities on April 22, 1992. Other information comes from the Institute for Transportation, Research and Education's (ITRE) study on roads, original construction drawings, and past experience with construction projects at the park.

Hanging Rock is one of four state parks in which most of the major park facilities were built in the late 1930's and early 1940's by the U.S. Department of the Interior's Civilian Conservation Corps (CCC). A major capital improvement program in the past five years renovated most of the aging facilities at the park. The bathhouse, vacation cabins, ranger residences, maintenance area, picnic area, entrance gate, personnel barracks, picnic toilets, trails, and water system have all been upgraded within the last five years. The sewer system is in poor shape as is the road system, which is scheduled for resurfacing in 1993.

This report is divided into five major sections: roads and parking areas; water system; sewer system; electrical system; and telephone system. Each section is broken into two parts: existing conditions and system recommendations.

ROADS AND PARKING AREAS

Existing Conditions

1. According to the Institute for Transportation, Research, and Education's (ITRE) study completed in March 1990, there are 3.8 miles of paved and 1.46 miles of unpaved roads. There are 23,728 square yards of paved parking lots and 5,590 square yards of unpaved parking areas.
2. The typical park road section consists of a 20-foot-wide pavement with three-foot-wide shoulders. The main road has an eight-inch stone base with a 1-1/2 inch layer of I-2 asphalt. The paved parking lots have an 18-inch rock curb and gutter, with a six-inch stone base that has a 1-1/2 inch asphalt layer.
3. The road system is in poor shape due to tree roots causing pavement cracking and upheavals.
4. There are several tree roots that need to be removed from beneath the road to prevent further damage. The majority of the pavement cracking has been sealed with asphalt by N.C. Department of Transportation.

5. The roads and parking lots need to be striped.
6. The majority of the park roads were resurfaced in 1977, including the camping area B and office road, which was graveled.
7. The majority of the pipe culverts along the main entrance road are metal and in fair shape. The culverts in the campground are concrete and in good shape. The culvert at the bathhouse bridge is in poor shape and should be improved by sliding a culvert inside.
8. The only bridge in the park, located on the camping road, appears to be structurally sound, but it should be strengthened because it has a five-ton limit. The rock veneer around the retaining walls needs tuck pointing.

Recommendations for Roads and Parking Areas

1. The main park road needs to be resurfaced and striped. The wooden posts serving as a guard rail at the lake front dam should be replaced with a wooden guard rail. Roots need to be removed before resurfacing. Tree removal should be minimized and require the authorization of the park superintendent. The parking lots at the bathhouse need resurfacing at the same time to give a uniform appearance. This work is scheduled to be done next year by the N.C. Department of Transportation under the Parks Road Agreement for an estimated cost of \$110,000. In addition to the paving, most of the stone curbing (2,500 feet) in the parking lots needs to be replaced.
2. The existing unpaved roads should remain unpaved until other, higher priority road needs are met within the park system.

SEWER SYSTEMS

Existing Conditions

1. There are currently 10 active sewer systems in the park. They range in size from a 13,000-gallons-a-day septic tank to a 1,000-gallons-a-day septic tank with conventional nitrification lines.
2. It was not possible, given time restraints, to inspect every tank and distribution box or locate all nitrification lines to make a proper evaluation of the sewer system. There is very limited information in the drawing files as well. The information given below is the best that could be collected on the different systems.

3. Camping Area and Cabin Sewer System - This system is a 13,000-gallons-a-day septic tank with a dual eight-inch dosing siphon. Only one siphon is working at the present time. The system is located about 2,000 linear feet along the ridge line from cabin #6.

The septic tank and nitrification field were built in 1940. Six 180-linear-foot drainfield lines run parallel to the slope. Only three lines are receiving any sewage effluent at the present time, and there were signs of sewage overloading at two locations.

The six-inch sewage outfall lines serving the system were replaced in 1972. There are 3,400 linear feet of six-inch vitrified clay (V.C.) pipe and 22 brick manholes with rings and covers running to washhouse A. The cabin outfall line also runs into this system, and it has 800 linear feet of six-inch V.C. pipe, with four manholes. The washhouse B outfall lines run into this system. It was constructed in 1960 and has approximately 500 linear feet of six-inch V.C. pipe, with two manholes.

A six-inch rain fell the day before the inspection, and what appeared to be five-to-seven gallons a minute of groundwater was getting into the collection system.

4. The Bathhouse System - This system has a 5,400-gallon septic tank with a single dosing siphon. It was partially replaced in 1988 when the bathhouse was renovated.

The picnic area toilets and a portion of the sewer line that runs underneath the parking lot from the bathhouse haven't been replaced. Approximately 10 gallons per minute of groundwater was flowing into this system, primarily from the picnic toilets' outfall line. The picnic toilets' outfall line, constructed in 1950, has three manholes with 450 linear feet of six-inch vitrified clay pipe and 150 linear feet of four-inch clay pipe from the toilets.

The outfall line from the septic tank to the drainfield was replaced in 1988. This line is approximately 1,000 linear feet in length and is six-inch PVC pipe with six manholes.

The drainfield has a distribution box with five lines that divide into 10 lines approximately 100 feet in length. The drainfield has recently been moved. The distribution box has a cracked lid. The septic tank drainfield was constructed in 1938.

5. Lower Picnic Area Toilets - This system has a 2,000-gallon septic tank located between the two toilet buildings. The drainfield is 250 linear feet and is a trench filter type. The outfall lines to the septic tank were replaced when the

toilets were renovated in 1987. This system appears to be working satisfactorily. The septic tank and drainfield were constructed in 1939.

6. Office Septic System - This system appears to have a 1,000-gallon septic tank with one 130-foot drain line. The drainfield has grown up with trees.
7. Shop Sewer System - This system appears to have a 1,000-gallon septic tank, with one 130-foot drain line. There are no septic risers on any of the office or shop systems.
8. Superintendent's Residence Sewer System - This appears to be a 1,000-gallon septic tank with two 100-foot lines. It was constructed in 1955. There have been no problems to date.
9. Sewer System for Ranger Residences - These systems all have 1,000- to 1,200-gallon septic tanks with two or three drain lines. No tanks have risers, but they have been pumped out within the last few years.
10. Personnel Barracks Sewer System - This system has a 1,200-gallon septic tank with two or three nitrification lines. There are no inspection risers. Drainlines are in the woods.

Recommendations for Sewer Systems

1. Camping and Cabin Sewer System - A new sewer system should be constructed at another location. A feasibility study to determine a site near the existing facilities will be necessary. This is the largest sub-surface sewer system within the state park system, and removing one of the campgrounds from the system would be beneficial. The estimated construction cost, including the feasibility study, is approximately \$100,000. The 3,400 linear feet of sewer outface is 20 years old and will soon need replacing. The location of the new sewer system will determine the need to replace the outface system.
2. Bathhouse Sewer System - At the present time, this system seems to be working satisfactorily except for the groundwater infiltration on the picnic toilet outfall line. Replacing the picnic outfall line with new line and manholes is recommended. The installation of new manhole rings and covers on the septic tank and dosing tank and a new distribution box at the drainfield are also recommended. The estimated cost is \$35,000. It would be advisable to explore a new drainfield location for this area as well; a site closer to the bathhouse would be more economical.
3. The Lower Picnic Toilet Sewer - The system is old enough to be replaced, but seems to be functioning satisfactorily. A

concrete manhole riser with ring and cover needs to be installed over the septic tank, and the trench line needs to be located and cleared of trees. The tank has never been pumped out and needs pumping. The estimated cost is \$4,500.

4. Office Sewer System - Manhole ring and cover need to be installed and the tank pumped out. Since the office is scheduled to be replaced in the near future, there is no need to clear the drainfield. The estimated cost is \$500.
5. Maintenance Area Sewer - Install inspection ring and cover, and pump out septic tank. Estimated cost: \$500.
6. Park Superintendent's Residence - Since a new house is being built at this location, installing a new sewer system is recommended. Estimated cost: \$4,500.
7. Three Ranger Residences Sewer System - All three systems need inspection risers, and the tanks need to be checked for pumping. Two of the houses need some addition nitrification lines installed. Estimated cost: \$5,000.
8. Personnel Barracks - Install riser and pump out septic tank. Clear drainfields. Estimated cost: \$2,000.
9. Total Recommended Repair Costs: \$152,000.

WATER SYSTEM

Existing Conditions

1. Water is currently supplied to the park by a 250,000-gallon open reservoir fed by springs. This system was built by the Civilian Conservation Corps (CCC) in 1938. The water is gravity fed through a six-inch PVC distribution line to the campground; it then reduces to a four-inch PVC line and goes to the bathhouse, converting to a two-inch galvanized water line and flowing to the picnic toilets, park office, and the three ranger residences at the bottom of the mountain. It also serves the personnel barracks and group camp, as well as three private residences outside the park. The total length of this distribution system is approximately 15,000 linear feet.
2. Due to EPA regulations on springs and stricter testing requirements, the park is in the process of eliminating the springs as its water source. Water wells have been dug at three different areas of the park to eliminate the need for one central water system. The well at the lower three ranger residences and personnel barracks produces 12 gallons a minute. The well at the maintenance center produces eight gallons a minute and is 800 feet deep.

The well located in the campground yields 21 gallons a minute and supplies the highest quantity and quality water of all the wells in the park. This well will serve as the primary well for the park. A back-up well located beside the chlorination house yields eight gallons per minute and serves as a back-up to the 12-gallon-per-minute well.

3. The water storage is provided by two 20,000-gallon steel storage tanks located about 200 feet above the chlorination house. The water then flows by gravity through the existing distribution system to the bathhouse. This distribution system was replaced in 1985 with six- and four-inch PVC piping.
4. The two-inch galvanized piping that begins at the bathhouse and goes to the bottom of the mountain was installed in 1964. It is currently under contract to be replaced only to the lower picnic toilet.
5. The second water system, located at the maintenance area, is under contract to build. It consists of a well, chlorinator, and small well house located behind the maintenance shop. It supplies the shop office and superintendent's residence. There are approximately 800 linear feet of one- and one-and-a-half-inch waterlines within this system.
6. The third water system, located beside the personnel barracks, serves the barracks, three ranger residences, the group camp, and three private residences outside the park. It has a well house, bladder-control storage tank, and chlorinator. This system was constructed in 1990. There are approximately 2,200 linear feet of PVC waterline within this system. The line to the group camp and the private residences is under construction at the present time.

Recommendations for the Water System

1. With the scheduled completion of the present water system improvement project by Shiloh Utilities in the fall of 1992, the park water system should be in good shape.
2. The distribution system in campground A will be the only waterline not replaced within the last seven years. Replacing these lines under the present contract as a change order is recommended. The estimated cost is approximately \$15,000.

ELECTRICAL POWER DISTRIBUTION SYSTEM

Existing Conditions

1. Power is supplied to the park by Surry-Yadkin Electric Membership Corporation located in Dobson, North Carolina.
2. The park has both overhead and underground power. All facilities above the existing park office are supplied power by a 10 kv/single-phase primary underground power cable owned by the park. This line was replaced in 1988 by a sub-contract through the power company to Pike Electrical Contractor. There are approximately 6,500 linear feet of underground power line, with eight pad-mounted transformers.
3. The overhead power line feeding the office and maintenance area is approximately 5,500 linear feet with 22 poles. It is owned by the power company.
4. The pad-mounted transformers were not replaced when the underground cable was replaced. These particular transformers are outdated, and parts are hard to find.

Recommendations for the Power Distribution System

1. Turning over the underground power to the power company is recommended if service as it now exists can be maintained.
2. If the power company will not take over the power system, upgrading the pad-mounted transformers is recommended. Estimated cost: \$20,000.

TELEPHONE SYSTEM

Existing Conditions

1. The phone system is owned by Centel Phone Company located in Madison, North Carolina.
2. There are two phone lines serving the park office, which has three phones. The four residences have private lines.
3. A pay phone is located outside the park office beside the parking lot. There is no phone service to the swimming area or campground.

Recommendations for the Telephone System

1. Install a public phone in the campground and at the bathhouse.

2. The existing office needs another phone line to serve the fax machine.
3. The phone company will continue to maintain phone service to existing phones.

SUMMARY

1. The main park road needs to be resurfaced within the next year. Tree roots and trees on the edge of the road need to be removed under the superintendent's supervision. The present N.C. Department of Transportation funding should be adequate to do this work.
2. The utilities are in good shape except for the sewer system. A designer needs to be hired as quickly as possible to get this work underway.

MAJOR CAPITAL IMPROVEMENT PROJECT PRIORITIES

The draft Hanging Rock State Park Master Plan describes the long-range vision of what the park should be. A significant portion of the master plan is devoted to identifying short- and long-term development plans for the park. The development plans are to be implemented by identifying and detailing specific capital improvement projects that can be constructed through the state construction process. By identifying, evaluating and ranking each development project, the Division has created a priority list of capital improvement projects for each park and for the state parks system. The Hanging Rock State Park project ranking is based upon objectives such as promoting public health, protecting natural resources, enhancing environmental education, increasing public accessibility, and improving the park's appearance (Table VII-4).

Table VII-4. Pre-GMP Project Priority List

Rank	Description	Mean Score	Total Costs
1.	Camping area dosing tank repair	602	\$ 14,200
2.	Visitor center and rental cabins	598	<u>1,501,589</u>
		TOTAL:	\$1,515,789

RECOMMENDED CHANGES TO PROJECT PRIORITY LIST

As part of the general management plan process, the master plan was reviewed to determine if changes were needed. The evaluation team considered factors such as changes in environmental regulations, condition of facilities, natural heritage inventory, changes in recreation demand, park visitor safety considerations, State Parks Act stipulations, and current recreation demand. The GMP review resulted in changes, additions, and deletions to the pre-GMP capital improvement priority list (Table VII-4). The changes are described individually in this section and then summarized in the revised capital improvement priority list (Table VII-5).

The Hanging Rock master plan is nearly complete. The only new visitor facilities being recommended are a visitor center and four

rental cabins. The visitor center recommended by the general management plan will serve as the park office as well as providing a classroom, interpretive exhibit space, and laboratory space. It will thus replace the park office and environmental education center recommended in the master plan. The master plan also recommends visitor facilities at the Dan River as well as horse trail head and camp. These projects are discussed further in Chapter VIII.

The park land available for future development in the center of the park is limited to the bowl-shaped area where the current visitor facilities are located. The severe slopes dominating the majority of the park are not suitable for development. Significant resources should be devoted to ensuring that the intensive visitor use that the park receives, particularly on the trail system, can be accommodated.

Capital improvement project descriptions include detailed construction cost information, proposed site location, the rationale for the project, as well as the estimated annual cost of properly operating and maintaining the project. These project descriptions provide the most accurate information on proposed changes to the 1976 master plan (Appendix B).

Projects to be Deleted

1. The visitor center and rental cabins project (\$1,501,589) was split into two projects because the visitor center carries a higher priority. The projects were previously funded and designed together but funding for construction were reverted.

Projects with Changed Scopes

1. The camping area dosing tank repair project was expanded to include all sewer, water, electrical, and telephone system repairs described in the road and utility inventory report (\$228,000).

Projects Proposed to be Added to List

1. The visitor center project (\$1,799,400) will replace the existing office as well as the environmental education center described in the master plan. The visitor center location will be adjacent to the parking lot serving the Hanging Rock Trail, Upper Cascades Trail, and lower picnic area.
2. The construction of four rental cabins (\$360,700) will complete the cabin expansion as per the master plan.
3. The trail renovations project (\$1,507,200) will entail making

all repairs to the existing trail network in the park according to the trail evaluation in Chapter VIII.

4. The building renovations and demolitions project (\$101,800) will make repairs to four buildings needing major repairs and demolish six buildings as described in the Facility Inventory and Inspection Program report (Table VII-3).
5. The group camp improvements project (\$91,500) will upgrade sanitary and site facilities to minimum park standards.

Table VII-5. Revised Project Priority List

Rank	Description	Mean Score*	Total Costs
1.	Visitor center	628	\$1,799,400
2.	Trail renovations	582	1,507,200
3.	4 rental cabins	538	306,700
4.	Group camp improvements	494	91,500
5.	Building renovations	483	101,800
6.	General utility repairs	473	228,000
TOTAL:			=====
			\$4,088,600

* The mean score comes from the Division's Project Evaluation Program (PEP). The PEP uses an evaluation formula to rank projects that considers three factors: the objective of the project; the justification or urgency for funding; and the estimated annual number of persons (visitors and/or employees) who are affected by the project. Projects are evaluated by the park superintendent, district superintendent, and Division management.

VIII. PARK OPERATIONS

INTRODUCTION

As a destination park, Hanging Rock State Park has been visited by generations of North Carolinians and tourists. The outstanding natural setting and recreational opportunities continue to attract a quarter million visitors annually. This chapter identifies the park operations issues at Hanging Rock and makes recommendations for addressing those issues during the next five years. These are:

1. park staffing levels;
2. operating and equipment budget;
3. the status of interpretation and education programs;
4. rock climbing;
5. staff training;
6. recruiting and retaining lifeguards;
7. developing and managing the Dan River Section; and
8. the status of the trail system.

STAFFING LEVELS

Issue: The park staff (six permanent full-time and one permanent half-time position) is not adequate to properly manage the park, adequately maintain and staff facilities, and conduct interpretation and education programs that satisfy visitor expectations and legal stipulations.

Background: Patrolling the park, monitoring use of back country facilities and areas, managing overnight facilities, providing interpretation and education programming, managing the office, performing clerical tasks, and managing natural resources require significant amounts of staff time. At Hanging Rock, three park rangers patrol 6,341 acres and 20 miles of hiking trails, maintain 27.6 miles of boundary, respond to all law enforcement and emergency incidents, and present interpretive and educational programs. The volunteer program attracted and supervised 162 people contributing 2,176 hours in the park. Over 14,300 visitors either attended or participated in an interpretive program in 1991.

Two maintenance mechanics with a seasonal staff of three park attendants maintain 39 structures along with grounds and trail maintenance and facility cleaning.

A half-time clerk-typist accounts for and deposits park receipts that totalled \$155,784 in 1991. The position also handled all cabin, group camping, and shelter reservations in addition to serving as the receptionist, secretary and radio dispatcher for the entire park staff.

Recommendation: An additional full-time maintenance mechanic and general utility worker (GUW), as well as a seasonal GUW and hired laborers are needed to perform the basic maintenance of facilities and roadways, grounds maintenance, and trails upkeep.

The half-time clerk/typist position should be expanded to full-time, with supplemental peak-load clerical support to meet the demands for providing park information, handling receipts, operating the reservation system and providing secretarial support to the entire park staff.

Two additional park ranger positions are needed to manage natural resources and to manage and patrol the back country and satellite areas of Hanging Rock. A larger ranger staff will address natural resource management issues, help inventory the parks natural resources, or coordinate research through the university system. Specific issues identified during the GMP process include developing mitigation alternatives for control of the gypsy moth prior to a major infestation; addressing the impacts of rock climbing on vegetation; and developing and implementing a natural resource management plan. A natural resource specialist is needed also in each state park district to provide greater expertise.

Additional rangers will allow better coverage of Hanging Rock, Cooks Wall, Moore's Knob, Tory's Den, Lower Cascades and the river section. Additional seasonal and peak load park attendants are also needed to support the ranger staff (Table VIII-1).

Table VIII-1. Staffing Needs.

Current Staff		Proposed Additions	
		Permanent	
Superintendent	1	Ranger	2
Ranger	3	Maintenance Mechanic	1
Maintenance Mechanic	2	Clerk-Typist	1/2
Clerk Typist	1	General Utility Worker	1
		Seasonal	
Clerk Typist	1	Park Attendant	2
Refreshment Stand Manager	1	General Utility Worker	1
Refreshment Stand Clerk	1		
Bathhouse Manager	1		
Bathhouse Operator	1		
Park Attendant	3		
Lifeguard	5		
Chief Lifeguard	1		
		Peak Load	
Clerk Typist	1	Park Attendant	1
Park Attendant	2		
Refreshment Stand Clerk	2		
Bathhouse Operator	5		

OPERATING AND EQUIPMENT BUDGET

Issue: The budget for operations, equipment, and supplies is not adequate to effectively manage the park. All program areas are affected, including natural resource management, interpretation and education, emergency services, and maintenance.

Background: There are critical shortages in line items 1411 (temporary wages & peak load positions), 2400 (maintenance & construction supplies) and the 5000 series (office, educational equipment).

Peak Load Wages (line item 1411): The budget for temporary wages has decreased by \$1,000 in the last 20 years. In 1972, this budget bought 5,667 hours of labor as compared to 1,647 hours in 1992 (a 70 percent decrease), while park acreage, visitation, and workload have increased. For example, since the cabins have been winterized, the rental season has been extended, and this generates higher labor costs for clean-up.

Seasonal Wages (line item 1491): At least two extended-season park attendants are needed (six-month positions). Currently, the park has a seasonal general utility worker and two seasonal park attendants (three-month positions). There are serious operational staff deficiencies in March, April, October, and November while the cabins are still open and park use is still heavy. Seasonal park attendants are needed to assist park rangers so the rangers can give greater attention to the interpretation and education (I&E) program and reach a greater percentage of visitors. The park attendant position could also help cover back county patrol during busy weekends.

Janitorial Supplies (line item 2110): Additional funds are needed for cleaning supplies because of the longer cabin rental season and price increases.

Educational and Scientific Supplies (line item 2310): Additional supplies are needed to meet the standards set by Division guidelines for interpretive programming and resource management research.

Medical and Agricultural Supplies (line item 2360): Additional grounds care, landscaping and emergency medical services supplies are needed.

Maintenance and Construction Supplies (line item 2400): The current budget, when distributed only to building maintenance, provides only \$113 per building each year. This is inadequate for cyclic maintenance program needs. Small hand tool replacement, sign repair, paint materials and other construction supplies must also come from this budget.

Miscellaneous Parts (line item 2530): As equipment ages, an increased budget for spare parts funding is needed for repairs.

Purchases for Resale (line item 2700): An increase in this line item would allow the park to expand its variety for resale and increase revenues. If this line item is significantly expanded, office staff should also be increased to sell the merchandise.

Other Supplies (line item 2990): The law enforcement function has been added with minimal budget support. Additional funds are needed to equip vehicles with sirens, meet guidelines on annual equipment replacement, and replace worn leather gear.

In-State Travel Transportation (line item 3111): Funds are needed to meet the minimum monthly charge for the Division of Administration vehicle, which is a mandatory expense.

Telephone (line item 3120): An additional \$1,000 is needed to add a phone line for the FAX machine and provide an additional "call-out" line when the main park line is tied up with reservations and general park information.

Repairs to Buildings (line item 3510): Increased cyclic building maintenance is needed.

Other Repairs (line item 3590): Old equipment requires more frequent repairs.

Advertising (line item 3700): Funds are needed to advertise in national magazines for a campground host. This investment will more than pay for itself in hours logged by these volunteers working in the campground.

Other Services (line item 3990): Trail signs are needed.

Reference Books (line items 5600): Rangers have become involved in researching and developing teaching guides and environmental education activities requiring a reference library.

Recommendations: The park must be allocated an operating budget that adequately provides for equipment, materials and supplies needed for daily maintenance and park operations. Generally, a 25 percent increase in the current non-personnel budget is needed to support the current visitation, facilities, and operation level. An increase in the equipment budget will replace aging equipment, some nearly 50 years old, and upgrade the operation.

The proposed budget indicates that greater funding is needed in many line items: seasonal staffing, educational supplies, maintenance supplies, repairs, and motor vehicles (Table VIII-2). Given the park's current size and facilities, the operating and equipment budget should be \$219,768. Donations and public awareness of this shortfall should be encouraged by making this list public.

Table VIII-2. Proposed Operating and Equipment Budget.*

Line Item	Description	1991-92 Budget	Proposed Budget
1411	Peak load wages	\$ 7,000	\$ 11,216
1491	Seasonal wages	31,266	41,743
2110	Janitorial supplies	3,000	3,800
2130	Uniforms and clothing	2,800	2,800
2190	Household cleaning supplies	300	600
2310	Educational & scientific supplies (35mm camera, Polaroid camera, geology field kit, spotting scope, and binoculars (6))	1,000	3,550
2360	Medical & agric. supplies (life preservers (8), throw rope rescue bags (3), life guard umbrella, fire fighter helmets (6), basket stretcher, emergency medical technical bag)	450	2,155
2400	Maintenance & Construction Supplies (push mower, forks for tractor bucket, animal trap, router, belt sander, measuring wheel for trails)	4,000	7,375
2520	Tires & tubes	800	1,400
2530	Misc. parts	500	700
2590	Other motor vehicle operations	1,300	1,300
2600	Office materials and supplies (calculator, office furniture)	600	1,575
2700	Purchases for resale	18,000	20,000
2920	Photographic supplies	150	200
2990	Other supplies (megaphones (5), siren/speakers (4), fire extinguisher)	400	3,000
3111	Travel in state- transportation	2,800	3,654
3210	Telephone	1,800	2,800
3510	Repairs to Buildings	1,000	3,000
3520	Fuel	1,000	1,000
3590	Other repairs (welding services, septic tanks pumping, misc. repairs to power tools)	1,000	4,000
3700	Advertising	50	450
3990	Other services	400	900
4390	Rental of equipment	0	250
4400	Service & maintenance contracts	0	500
5100	Office furniture and equipment	0	2,050
5200	Data processing equipment	0	3,000
5300	Educational equipment	0	28,000
5400	Motor vehicles	0	54,000
5430	Boats and trailers	0	6,400
5500	Other equipment	0	7,950
5600	Reference books (updated law books, BLET materials, Interpretation & Education books)	0	400
TOTAL:		79,616	219,768

* This table presents an adequate operating and equipment budget for Hanging Rock State Park given current levels of visitation, facilities, and staffing. The budget does not include salaries for permanent positions.

A return to greater flexibility in line item control within the park would allow park management flexibility to use funds where most needed. In-park transfers between line item series could save on overall budget expenditures.

A detailed equipment list is also presented by line item (Table VIII-3). Staffing needs are discussed separately and thus permanent staff salaries are not included in the proposed budget.

Table VIII-3. Detailed Equipment Budget Needs.

Line Item	Description	Additional Need
5100	Office Equipment (Copier, Telephone System, Fax Machine, Desk)	2,050
5200	Data Processing Equipment (Personal Computer System)	3,000
5300	Educational Equipment	28,000
	Camera/tripod/lenses	\$1,000
	Slide projector /lens	850
	Binoculars	\$600
	VCR/Monitor/Cart	200
	Books and subscriptions	500
	Microscope	1,000
	Tape player w/microphone	300
	Projection screen	200
	Dissolve unit	200
	Spotting scope	400
	Weather monitoring kit	500
	Aquatic equipment (nets,tanks)	1,000
	Sampling equipment(soil,plants, nets, magnifying lenses)	1,000
	Terrarium, insect kits	1,000
	Miscellaneous equipment	500
	Easel	200
	Mammal case	350
	Cordless microphone	300
	Film projector	300
	Filming supplies	200
	Interactive computer system	15,000
	Micro-projector	
	(microscope w/projection screen)	600
	Slide storage cabinet	800
	Camcorder	1,000
5400	Motor Vehicles	54,000
	pickup trucks (2)	\$ 26,000
	tractor	20,000
	ATV and trailer	8,000
5430	Boats and Trailer (Row Boats (8))	6,400
5500	Other Equipment	7,950
	air conditioner	\$ 600
	fire hose and nozzle	500
	base radio	1,000
	radial arm saw	4,000
	floor buffer	1,200
	hand-held radio with keypad	650
TOTAL:		\$ 101,400

Note: The equipment budget is summarized and included in the operating and equipment budget using the appropriate line item (Table VIII-2). This detailed equipment budget presents specific equipment needs within each equipment budget line item.

SUPPORT FOR INTERPRETATION AND EDUCATION PROGRAMS

Issue Statement: Current interpretation and education (I&E) exhibits and facilities do not adequately inform and educate visitors.

Background: Every state parks system unit needs high quality exhibits and facilities to support the State Parks Act mandate to promote pride in and understanding of North Carolina's natural heritage. Exhibits, brochures, and programs are primary means of educating visitors about the park's interpretative themes (identified in Chapter 3) and informing the public about safety and resource management issues.

No indoor I&E space is available at Hanging Rock. This limits programs on rainy days and during the winter, and prevents daytime slide or film programs. As North Carolina's population grows older, demand for programs that are easily accessible and indoors should increase. Local arts council programs recounting historic events attract large numbers of visitors. It is difficult to meet the visitors needs and those of the performers with no indoor facilities. The only shelter currently accessible to those with low mobility is the bathhouse. The current park office is too small and has no I&E equipment and materials storage space.

Recommendations: Interpretation and education equipment and supplies should be increased significantly as soon as possible (Table VIII-4). The proposed visitor center should be built within the next five years with the following facilities: an auditorium (seating capacity: 75); a classroom with wet lab capability (seating capacity: 30); a work room with storage space (500 square feet); exhibit space; and adequate office space.

Table VIII-4. Proposed Visitor Center I&E Equipment/Supply Needs.

ITEM	COST
1 Camera/accessories/tripod/lenses	\$1,000
1 Slide projector W/appropriate lens	\$850
6 Binoculars	\$600
1 VCR-Monitor cart	\$200
Books and subscriptions	\$500
1 Microscope	\$1,000
1 Tape player w/microphone	\$300
1 Projection screen	\$200
1 Dissolve unit	\$200
1 Spotting scope	\$400
1 Weather monitoring kit	\$500
Aquatic equipment-nets,tanks, aquariums	\$1,000
Sampling equipment-soil,plants, water,nets magnifying lenses	\$1,000
Terrarium, "animal boxes",insect kits	\$1,000
Miscellaneous equipment	\$500
1 Easel	\$200
Mammal case	\$350
Cordless microphone	\$300
1 Film projector	\$300
1 Filming supplies	\$200
Interactive computer system	\$15,000
1 Micro-projector(microscope w/projection screen)	\$600
1 Slide storage cabinet	\$800
1 Camcorder	\$1,000

TOTAL	\$28,000

ROCK CLIMBING

Issue: Is rock climbing an appropriate activity in the park? If it is, what is the Division's responsibility to ensure the safety of the climbers? Is there adequate staff to control access to climbing sites and to control the activity? How significant are the natural resource impacts, and what measures should be taken to control them? What are the visitor safety issues, and how can Division liability exposure be minimized? What should be the elements of a rock climbing management plan, and can that plan be developed as part of this GMP process?

Background: Rock climbing is a high-risk adventure activity that is popular at Hanging Rock State Park and is currently allowed at Cook's Wall and Moore's Wall. Most of the climbing activity occurs at Moore's Wall, which is accessed through private property by the majority of the climbers. The private property access is preferred by climbers, probably because it allows motor vehicles much closer access to the climbing wall than does the park access, which is a strenuous hike via the Moore's Knob Trail. In addition, at least one private property owner near Moore's Wall allows informal camping for climbers on his property. The Cook's Wall climbing area is less popular because of the long hike necessary to reach the area.

Management of rock climbing consists of a self-registration system and informing climbers that no new climbing routes are allowed. Rock climbers are responsible for the safety of the routes they use. No studies have been done to determine if rock climbing causes significant natural resource impacts.

Recommendation: Climbing access within the park is provided via the existing trail system during the park's hours of operation. No additional controls are needed presently. Another ranger position is needed (at least during the visitor season) for general patrol purposes, including the climbing areas.

The park should continue to prohibit the installation of permanent climbing aids for resource protection and safety reasons. A study of Moore's Wall should be conducted to inventory the natural resources as measure the impacts created by rock climbing.

Climbing activity is an assumed risk on the part of climbers. Additional controls by the Division (such as mandatory equipment inspections) could increase our liability exposure; therefore, such controls are not recommended.

RECRUITING AND RETAINING LIFEGUARDS

Issue: Recruiting and retaining lifeguards for the swimming areas is a problem because state parks system wages are no longer competitive.

Background: Hanging Rock State Park currently has six lifeguard positions, one of which is classified as a chief position. This number meets the standards established by the Water Safety Congress.

Prior to the general management plan, salary rates were:

Chief Lifeguard	-	\$4.81 per hour
Lifeguard	-	\$4.62 per hour

These were the same rates established by the 1986 pay scale. It has been determined that the Division of Parks and Recreation could be authorized by Department of Personnel to pay at a higher pay scale provided funding was available. As of January 1993, lifeguard wages were raised to the following levels:

Chief Lifeguard	-	\$6.34 per hour
Lifeguard	-	\$6.12 per hour

Training and certification opportunities are very limited in the rural areas. The number of paying swimmers is consistently at 28,000 each year. Swimming has been a popular activity at Hanging Rock since the 1940's. It has one of the higher ratios of swimmers to park visitors in our system. Approximately \$400,000 has been invested in the bathhouse restoration and beach access improvements recently.

Recommendation: Swimming is an appropriate recreational activity and the lifeguard service should be retained. Returning employees should receive a 3 to 5 percent raise. The increased budget needs should be requested through the continuation reserve.

The park or the district should establish its own training classes. Contractual operation of a swimming area with lifeguard service is second in preference. Allowing swimming in unprotected waters is not recommended.

STAFF TRAINING

Issue: The complexities of park management require well-trained and skilled personnel to keep parks operating at a high level of efficiency. There is liability exposure connected with all positions involving the safety and protection of park visitors. This exposure extends to positions that involve the maintenance and upkeep of equipment and facilities and to jobs involving the protection of the natural resources of parks. The quality of prepared documents and the capabilities of office correspondence equipment are important to park operations as well.

Background: The implementation of many of the expanded programs and services that the Division has adopted requires a more highly skilled and trained professional staff. New regulations and reporting requirements for water and sewage treatment as well as monitoring and guideline standards for safety training and accountability have raised the level of training required for park staff. Some of the recent additions to training needs include the following:

1. MAINTENANCE STAFF: Class C well water operator, safety officer training, S-130/190, fire behavior and control school, CPR and first responder training, equipment operator certification, specialty skills training (woodworking, welding, masonry, small engine repair, auto mechanics, etc.)
2. RANGER STAFF: The range staff has four main areas of responsibility and these are, in priority order, interpretation and education (I&E), natural resource management, ranger activities (such as law enforcement, first aid, and search and rescue), and maintenance. Interpretation and education training should include interpretive skills I & II and Environmental Education Learning Experiences (EELE) training. Natural resource management training should be expanded within the Division and through other sources and should include basic boundary line management training. Ranger activity training should include basic law enforcement school, annual law enforcement review courses, S-130/190, first responder and CPR training and recertification, equipment operator training, and search and rescue training.
3. CLERK/TYPIST: This person serves as receptionist, secretary, bookkeeper, dispatcher, and information specialist. With an operation as complex as Hanging Rock's, tracking accounting information, use records, equipment, building and property maintenance, and inventory records has made a computer and printer a necessity. The clerk will need computer training, radio communications training, and modern office equipment.
4. SUPERINTENDENT: Personnel management skills training, safety accountability training, managing law enforcement operations, search and rescue, search management, interpretive skills for

park managers, resource management training, computer skills, EELE'S for managers, first responder/CPR training, public speaking skills and relating to the media training. A general complement of park management training courses.

Recommendations: A comprehensive training plan needs to be developed for the park for each position, but funding and opportunities for training must also be made available in order to keep a well-trained, professional staff. Many of the new certification requirements carry the obligation of annual updates or re-certification. Increased funding is necessary to expand the training program.

DAN RIVER SECTION

Issue: How should the Dan River Section be developed and managed?

Background: The area is currently open 24 hours/day. The Department of Transportation appears to be improving road access to the canoe ramps, possibly attracting more use to the area. The park master plan calls for a canoe campground which would require funds for installation of grills and toilets and cleaning, more frequent patrol of the area and more frequent cleaning. Potable water source development, treatment and testing would be necessary. Additional operating funds would be needed to manage this area. Horseback riders may want a horseback camping area here.

Recommendations: Conduct a feasibility study of this area to determine the development and management costs, the expected visitor use figures, and determine if the site is needed at the park within the five-year GMP time frame.

A carrying capacity for this area should be determined with resource management staff to set the size limits and location of facilities. If the area is developed, an increased operating budget is needed to cover the costs of increased patrols, vehicle operation and supplies. An additional full-time ranger and peak load support will be needed to manage the area and other satellites. Gate control will be needed to protect overnight users in the canoe campground.

TRAIL SYSTEM

Issue: During the general management planning process, three trails-related issues were addressed:

1. identifying current trail conditions and describing appropriate trail construction and widths;
2. addressing visitor safety at hazardous locations; and
3. responding to local interest in connecting regional trails systems to park trails.

Background: When Hanging Rock State Park was established in 1936, many of its trails already existed. Blazed by local users to view the park's many natural wonders, these trails usually took the shortest route to their destinations -- following along a ridge or beside a stream bed -- frequently opening the most environmentally sensitive and fragile areas in the park to trail users. Often, these trails were created without regard to proper trail layout or construction techniques. The trails' poor condition has a harmful effect on natural resources and creates visitor safety hazards.

The park contains within its boundaries 20 miles of trail for hiking and three miles for equestrians (Figure VIII-1). Some popular trail destinations, such as cliff areas and waterfalls, can be visitor safety hazards. The Lower Cascades area, the Hanging Rock summit, and the Window Falls area were identified as potentially hazardous during the GMP evaluation. The Division evaluated the actions that should be taken to address visitor safety, natural resource protection, and visitor use at these locations.

The Division invites the public to use operated units of the state parks system and has a duty to maintain the park in a reasonably safe condition and to warn visitors of:

- o hidden dangers,
- o hazards presenting a substantial risk of severe injury, and
- o areas where there is a history of accidents.

The actions taken to protect visitors must be balanced with the purposes of the state parks system and the park (Chapter II). In general, the GMP recommends addressing the issue of hazardous locations by specifically warning visitors of the dangers as well as the consequences of failing to heed the warnings and regularly inspecting these warnings. Warning signs should be located at trail heads of all trails with hazardous sections and appropriate locations on the trail. In some cases, the designated trails should be rerouted away from dangerous locations. These recommendations should be reviewed as liability case law or relevant general statutes change. Specific recommendations for each trail are given in the following sections.

Recommendations: This section describes the current status of each park trail and makes recommendations for correcting deficiencies. These recommendations are presented as long-term solutions, but will work only when accompanied by a routine maintenance plan.

HANGING ROCK TRAIL

The 1.2-mile-long Hanging Rock Trail is the park's most heavily used trail. The combination of steep slopes, poor trail routing, and decades of visitor use has caused significant erosion and compaction problems. Previous measures taken to address these problems include paving the first 0.2 miles of trail as well as closing and rerouting part of the original trail.

The most critical trail construction needs are surfacing and steps to accommodate the heavy use the Hanging Rock Trail is now experiencing. Surfacing and steps will improve the footing on the trail, address the natural resource degradation caused by the severe compaction and erosion problem, and improve the aesthetics.

The 0.2 mile-paved section of trail resembles a sidewalk. The aesthetics of this section should be improved by paving it with an exposed aggregate asphalt that includes a layer of small, natural stones that approximate the color and texture of local stone. This surface should be used from the parking lot to the top of the ridge and continue on to the base of the present steps, a distance of 0.9 mile.

The existing steps should be replaced from the end of the ridge to the base of Hanging Rock, using 6" x 6" timbers. The steps will be eight feet wide and use a 12 to 16 inch tread for a distance of approximately 440 feet.

The final 0.2 miles of the trail before the summit is very steep and highly eroded. Using native materials whenever possible, build stone steps as needed from the base of Hanging Rock to the top of the rock, a distance of approximately 0.2 mile. The section needs approximately 1,000 native stone steps from the base to the top of the rock.

The summit area provides panoramic views of the surrounding landscape from outcrops that form sheer cliffs. One person died after falling from the summit area about 20 years ago. Visitors have also been struck by lightning at the summit. Although the cliffs are an obvious danger, park visitors should be warned of the hazard because falling presents a substantial risk of severe injury. The danger from lightning is not apparent to most park visitors, and a warning is also appropriate.

Warning signs should be erected at the trail head and along the trail, just before the steep 0.2 mile ascent to the summit. The warnings should specifically describe the hazard and the conse-

quences of disregarding the hazard. When the steps to the summit are constructed, the warning sign should be placed at the base of the steps. Such signs are to be inspected on a regular basis. A warning about these hazards should be included in the next park brochure when it is reprinted.

COOKS WALL TRAIL

At approximately 2.3 miles in length, the Cook's Wall Trail's major need is routine maintenance. At last count, seven trees were down and approximately 11 waterbars were needed. The trail also needs one sign at Cook's Wall where the trail turns right and continues on for another mile. This last mile of the trail (not shown on the map) passes Devil's Chimney and ends with a spectacular view of the valley between the Cook's Wall ridge and Huckleberry Ridge. A sign reading "Trail ends one mile from this point" is needed to alert hikers that they must backtrack when the trail ends.

MOORE'S WALL SHORTCUT TRAIL

The Moore's Wall Shortcut Trail was built as a shortcut between Cook's Wall Trail and Moore's Wall Trail. It allows hikers access to the Moore's Wall Trail without having to hike all the way back to the Moore's Wall trailhead. This shortcut is .4 miles in length. It needs only routine maintenance.

CHESTNUT OAK NATURE TRAIL

The Chestnut Oak Nature Trail needs 28 interpretive signs, one at each of its stations. It also needs a program of routine maintenance.

WOLF ROCK TRAIL

The Wolf Rock Loop offers hikers an overlook with a view of Cook's Wall. The trail then loops back to its trail head at the parking lot. At 2.6 miles, the trail is a moderate walk. It needs 11 waterbars and routine maintenance.

HIDDEN FALLS/WINDOW FALLS TRAIL

The Trail: The Hidden Falls/Window Falls Trail is eroded, in many cases down to the rock. In some places ruts are almost knee high. The waterbars -- many not wide enough to reach across the trail -- fail to slow the flow of water and are ineffective; the water courses around the bars, displacing the fragile soil as it flows. The waterbars must be replaced and the trail reconstructed.

Window Falls Viewing Area: Window Falls is the second most popular visitor destination. The designated trail ends as visitors enter the Window Falls area by walking onto a large outcrop area. The outcrop area contains cliffs overlooking Indian Creek. A warning sign should be erected to alert visitors of these cliffs before they arrive at the outcrop area. Visitors have created paths from the outcrop down to two terraces -- a middle and a lower -- where visitors go to view the falls. The main path forks as it descends with the right fork going to the middle terrace and the left fork going to the lower terrace. The GMP evaluation recommends extending the designated trail to the lower terrace by building steps that follow the left fork because it offers a easier route.

The middle terrace is across from the area's main feature: a view of a waterfall through a "window" in the rock. There is a sheer drop of about 20 feet from the middle terrace that presents an obvious danger. Because visitors cannot see the waterfall through the window from the middle terrace, many people crawl into the window to view it, crossing slippery rocks and slopes to get to the window and to get down to the lower terrace. The rocks are often soaked and slippery due to rain and spray from the waterfalls. Because the area is somewhat shielded from the sun, slick mosses frequently form, retaining water, and the rocks seldom dry. The GMP recommends encouraging visitors to bypass the middle terrace by erecting a sign directing them to the lower terrace and by building steps that lead directly from the outcrop area to the lower terrace.

When the steps are added, the designated trail will extend to the lower terrace and encourage visitors to use the area to view the waterfall. The area has been impacted by decades of visitors, creating erosion and compaction problems that are evidenced by numerous exposed tree roots. To better accommodate the visitor use that is occurring, a viewing area should be constructed by creating a level surface from native stone cribbing and backfill. The viewing area should not be elevated nor enclosed by barriers or fencing. Visitors are obviously exploring the entire Window Falls area, but there is no history of serious injury in the middle or lower terrace area. Therefore, no improvements are recommended to accommodate people who hike up to the window area or around the waterfall. A sign should be located at the viewing area identifying Window Falls and warning visitors of the slick rocks around the window area and the waterfall.

The Indian Creek Trail continues through this area, drawing visitors on to the Dan River.

The Hidden Falls Viewing Area: This area has been severely eroded and compacted by intensive visitor use. This problem should be addressed by installing a level surface made of native stone cribbing and backfill that is not visually intrusive. The height of the cribbing should be minimized and no barriers or fencing should be constructed.

Recommendations:

1. Reconstruct the existing trail from the trail signs at the end of the picnic area to Window Falls. Build the trail to a width of four feet.
2. Replace all water bars (35 bars) with 6" X 6", pressure-treated, treated-for-ground-contact timbers, sized to the width necessary to slow the flow of water on the trail and prevent erosion by extending beyond the trail edge.
3. Fill eroded sections with crush and run stone.
4. Top with two inches of rock screening that approximate the color and texture of local stone.
5. To better accommodate the visitor use that is occurring at the base of Hidden Falls, a viewing area should be constructed by creating a level surface from native stone cribbing and backfill. The viewing area should not be elevated nor enclosed by barriers or fencing.
6. Alert visitors to the cliffs above Window Falls with a warning sign prior to their entering the area.
7. Extend the designated trail to the lower terrace using stone steps. Use a directional sign to encourage visitors to bypass the middle terrace.
8. To better accommodate the visitor use that is occurring at the base of Window Falls, a viewing area should be constructed by creating a level surface from native stone cribbing and backfill. The viewing area should not be elevated nor enclosed by barriers or fencing.
9. Erect a warning sign at the lower terrace viewing area that alerts visitors to the dangers of slippery rocks in and around Indian Creek.

INDIAN CREEK TRAIL

Built by volunteers, Indian Creek Trail is the newest trail at Hanging Rock State Park, and it is in good shape. To protect this trail, 37 trail steps using 6" x 6" timbers are needed, as well as a program of regular maintenance.

MOORE'S WALL LOOP TRAIL

The Moore's Wall Loop Trail, 4.2 miles in length, is probably the most versatile trail at Hanging Rock State Park. The loop leads to the park's highest point, Moore's Knob. A favorite hiking trail, the loop, with its many exposed rock faces, is also revered by climbers. Offering breathtaking panoramas of Stokes County and the park, the Moore's Wall Loop Trail is clearly a favorite among all those energetic enough to climb the strenuous slopes to the knob. Unfortunately, because of inordinate use, a section of the Moore's Wall Loop Trail is among the most eroded in the park.

The first half of the trail that leaves from the swimming beach parking lot and ascends to the top of Moore's Wall is in reasonably good shape. It requires only routine maintenance. It is the return portion of the trail -- a one-mile road bed built in the 1970's by the U.S. Forest Service to reach the tower on the Moore's Knob -- that needs the most work. This section of the trail has been severely eroded due to weather and over use. After even a minor rain, this road bed quickly becomes a temporary stream bed. With large rocks scattered everywhere, exposed tree roots, waist-deep step-downs, and a trail base with little or no remaining soil, this section of the trail is uncomfortable to hike.

To preserve the Moore's Wall Loop Trail for future use, this one-mile section needs immediate restoration. On the connecting section of the Loop -- from the campground down to the lake corridor -- there are approximately 50 water bars. These waterbars were designed and installed no doubt to inhibit the flow of water as it runs down the short 20-percent-plus slope that connects the loop on the Moore's Wall Loop Trail. Unfortunately, the trail has widened here, and water simply courses around the bars, continuing to erode the trail. These water bars need to be replaced and cleaned out periodically. They also should be an appropriate width to carry water off to the side of the trail and harmlessly away. To prevent more erosion, the bars should be replaced as soon as funds permit.

At least one fatality has occurred about three years ago on Moore's Knob as a result of lightning striking a visitor. Visitors should be warned of this hidden hazard.

Recommendations:

1. Reconstruct the existing trail to a width of four feet. Reroute the trail in places where erosion problems cannot be addressed through reconstruction.
2. Using native materials whenever possible and crush and run stone, fill eroded sections of the trail to a level base.
3. Top with two inches of rock screening that approximate the color and texture of local stone.
4. Using native materials when possible, construct stone steps as needed, four feet in width.
5. Replace approximately 50 water bars on the connecting section of the loop from the campground to the lake corridor.
6. Warn visitors of the danger of being struck by lightning at the Moore's Knob summit by placing a warning sign at the trail head and adding a warning in the park brochure at the next reprinting.

UPPER CASCADES TRAIL

Although this trail is one of the most newly renovated trails in the park, it sustains minor erosion due to its location, slope and use. To minimize the impact on the Upper Cascades Trail, it should be paved with exposed aggregate asphalt and have drainage structures installed where needed. Paving this trail is necessary to prevent continued erosion. The visual change can be minimized by rolling in a surface layer of small, natural stones that approximate the color and texture of local stone. Paving and drainage structures would prevent erosion and minimize maintenance.

The Upper Cascades Trail is the best location for a short side trail that would provide a universally accessible path to a rock outcrop. An outcrop is located about 100 feet off the existing trail in an area that can be traversed with a wheelchair. The Division should evaluate this opportunity to expand services to visitors with disabilities and, if it is feasible and appropriate, construct the trail.

LOWER CASCADES TRAIL

The Lower Cascades Trail leads to 150-foot-high cliffs overlooking the waterfalls, probably the most dangerous location in the park. The trail begins at a parking lot outside the main park entrance and follows an old road bed for approximately a quarter mile over relatively flat terrain. The designated trail ends approximately 50 yards from the cliffs at a sign directing visitors to the Lower Cascades Falls area.

Visitors are currently using a number of the eroded, informal paths through a wooded area to get to the cliffs. Visitors who hear the rushing water from the waterfall are blazing new trails as well. The paths go through a maze of boulders and "step downs" that are more than three feet deep in some cases. These paths emerge from the wooded area at a 20- to 25-foot-wide rock ledge that forms the top of the cliffs. The cliffs are a hidden danger because their height is not apparent until a visitor is at the edge and because visitors have no reason to suspect that high cliffs would be located in the flat terrain.

Although there is no history of accidents at the site, an additional hazard of the Lower Cascades Falls is the danger it poses to children. Adults who are unfamiliar with the area may allow children to run ahead. There are no warning signs at the Lower Cascades, and most adults will not know to warn their children. This situation should be corrected as soon as possible with warning signs and a well-defined safe trail route.

The Lower Cascades offers visitors cool water and one of the loveliest waterfalls in North Carolina. A trail down to the pool, however, does not exist. Visitors wanting to hike to the base of

the waterfall have created several routes down the slope. Park visitors will be better served and the natural resource will be better protected by a trail that can accommodate current and future visitor use.

Recommendations:

1. Reconstruct the existing trail to a width of three feet. Fill eroded sections of trail with crush and run stone, and top with two inches of rock screening that approximates the color and texture of local stone.
2. As soon as possible, warning signs should be placed in three locations to alert visitors to the dangerous cliffs overlooking the falls. The first sign should be placed at the parking lot; the second where the present "Lower Cascade Falls" sign directs visitors off the road bed toward the cliffs via informal trails; and the third should be just before the cliff area. The first two warning signs should specifically describe the danger and the consequences of disregarding the danger. The sign at the parking lot should warn parents to closely supervise their children. These signs must be inspected on a regular basis to ensure that they are in good condition. The signs at the cliff area should simply alert the visitor to the danger.
3. The long-term action needed to make the Lower Cascades Falls area safer involves creating a new trail route to an easily accessible viewing area away from the cliffs. The current Lower Cascades Trail should continue along the road bed past the trails that access the cliffs. A small ridge located approximately 50 yards past the cliffs is a safer area and provides a view of the waterfalls. The new trail routing should lead to this small ridge.

When the new viewing area is opened, vista clearing will be needed to maintain the view of the falls. An interpretive sign at the viewing spot will be used to identify the viewing area. A low, split-rail fence will be built to discourage visitors from going to the cliff area. A trail is also needed to accommodate the visitor traffic to the bottom of the falls. Stone steps should be used to go down the slope.

4. The park brochure should add a warning about the Lower Cascade Falls area the next time it is reprinted.

TORY'S DEN TRAIL

The Tory's Den Trail shares a corridor with the Moore's Wall Loop trail. It eventually turns west/northwest at approximately the one-mile point. From this point the trail is in reasonably good

shape. Beyond Huckleberry Ridge, the trail descends, eventually crossing S. R. 2028 or Charlie Young Road. To stabilize the trail and to prevent erosion, this portion of the trail needs approximately 72 waterbars, eight steps and a 32-foot bridge. Beyond those needs, and like most of the trails at Hanging Rock, the Tory's Den Trail needs a program of routine maintenance.

OTHER TRAILS

Stokes County and the Sauratown Mountain Range are fertile ground for the creation of trails. The Northwest Environmental and Historical Preservation Committee, the Sauratown Trails Association, the Friends of the Dan and Mayo Rivers, and the Stokes County Parks and Recreation Department are a few of the volunteer and governmental organizations actively involved in the creation of trail plans. Hanging Rock State Park continues to be the testing ground for the state trails system -- as well as the focus of many of these plans. Coordination of these plans with local governments and volunteer trail interest groups as they relate to the park is essential. Hanging Rock State Park is an important component of the Mountains-to-Sea Trail corridor.

Recommendations:

1. No new trails should be constructed at Hanging Rock State Park until existing trails are properly repaired and maintained.
2. Support the development of local, regional and state trails, understanding that Hanging Rock State Park is a natural connection and destination point for many of these trails.
3. Require that future connector trails crossing park property be developed by the following procedure:
 - A. The trail plan should be presented to the park superintendent for approval prior to any trail flagging or marking.
 - B. The flag line that is in compliance with trail guidelines, once they are approved, shall then be approved jointly by park staff, trails staff, the Division Operations Section, and the Division's Natural Resources Section before a trail corridor is cut.

MOUNTAIN BICYCLES

Mountain bicycle use at Hanging Rock State Park will be prohibited. Trail use inside the "bowl area" of the park is too intensive to safely accommodate mountain bicycles. Outside the bowl area, severe slopes make it difficult, if not impossible, to develop a trail that is sufficiently wide and long to accommodate mountain bicycles.

TRAIL SIGNS

Park trails have been mapped and are included in the general information brochure, just recently printed and available in most parks. The brochure accurately indicates each park's configuration of trails and each trail's location. This general information brochure is the only information furnished to visitors for their use in "navigating" the trails in the park.

Throughout Hanging Rock, signs indicating a visitor's location are lacking. Location signs are needed throughout the park at each trail head and at each trail intersection. Ideally, these signs would direct visitors to points of interest in the park, display the length and difficulty of each trail, and indicate whether the trail is a loop or if one must backtrack. Currently, a standard sign system is being proposed for each park. The estimated cost per park is \$3,000. This cost is based upon information gained through a recent sign system study.

ADDITIONAL STAFF

Two maintenance positions should be added to work primarily as a trail crew, with support from volunteers and community service workers. The trails staff will assist in any training necessary to accomplish needed trail repairs.

CONCLUSION

The trails at Hanging Rock State Park have been nearly "loved to death." Many have been so over used they have sustained nearly irreparable resource damage. Some trails lead to areas that are dangerous to park visitors. The continued use of these areas, without making necessary repairs, ensures further deterioration and constitutes a high-risk problem.

Resource management staff will be consulted concerning the location, routing, design, and potential impacts of any new or existing trail prior to work beginning.

Any progress on the reconstruction of trails at Hanging Rock State Park by existing staff will be negligible because of the magnitude of the renovation needs and the excessive demands placed on a small park staff. Trails are an essential visitor service, as important as any public facility, including bathrooms, swimming pools, campgrounds and interpretive programming. If they continue to receive limited attention -- i.e., in funding, additional staff, support, etc. -- the trails at Hanging Rock State Park will simply continue to deteriorate.

IX. LAND ACQUISITION NEEDS

LAND ACQUISITION STATUS

Hanging Rock State Park contains 6,193 acres. Hanging Rock State Park was not specifically included in the 1985 appropriation for state park land acquisition. However, funds allocated for scenic protection of and public access to state trails were used to acquire 339 acres to provide a route for the planned Mountains-to-Sea Trail. A Recreation and Natural Heritage Trust Fund grant was awarded in 1991 for the acquisition of 147 acres on the slopes of Hanging Rock Ridge.

FUTURE LAND ACQUISITION NEEDS

To complete the master plan for the park would require the acquisition of 2,200 acres. Land acquisition objectives are to eliminate partial inholdings, to provide a route and access for a segment of the statewide Mountains-to-Sea Trail, and to protect and buffer the natural and scenic features of the park. Portions of Ruben Mountain and the escarpment known as Moore's Wall and Cook's Wall are still privately owned (Figure IX-1).

SUMMARY TABLE

1985 size of the park	5,855 acres
1985 land program additions	<u>339 acres</u>
Current size of the park	6,194 acres
R&NHTF grant addition	<u>147 acres</u>
1992 size of the park	6,341 acres
Master planned needs	<u>2,200 acres</u>
Master planned size of the park	8,541 acres

HANGING ROCK STATE PARK LAND ACQUISITIONS

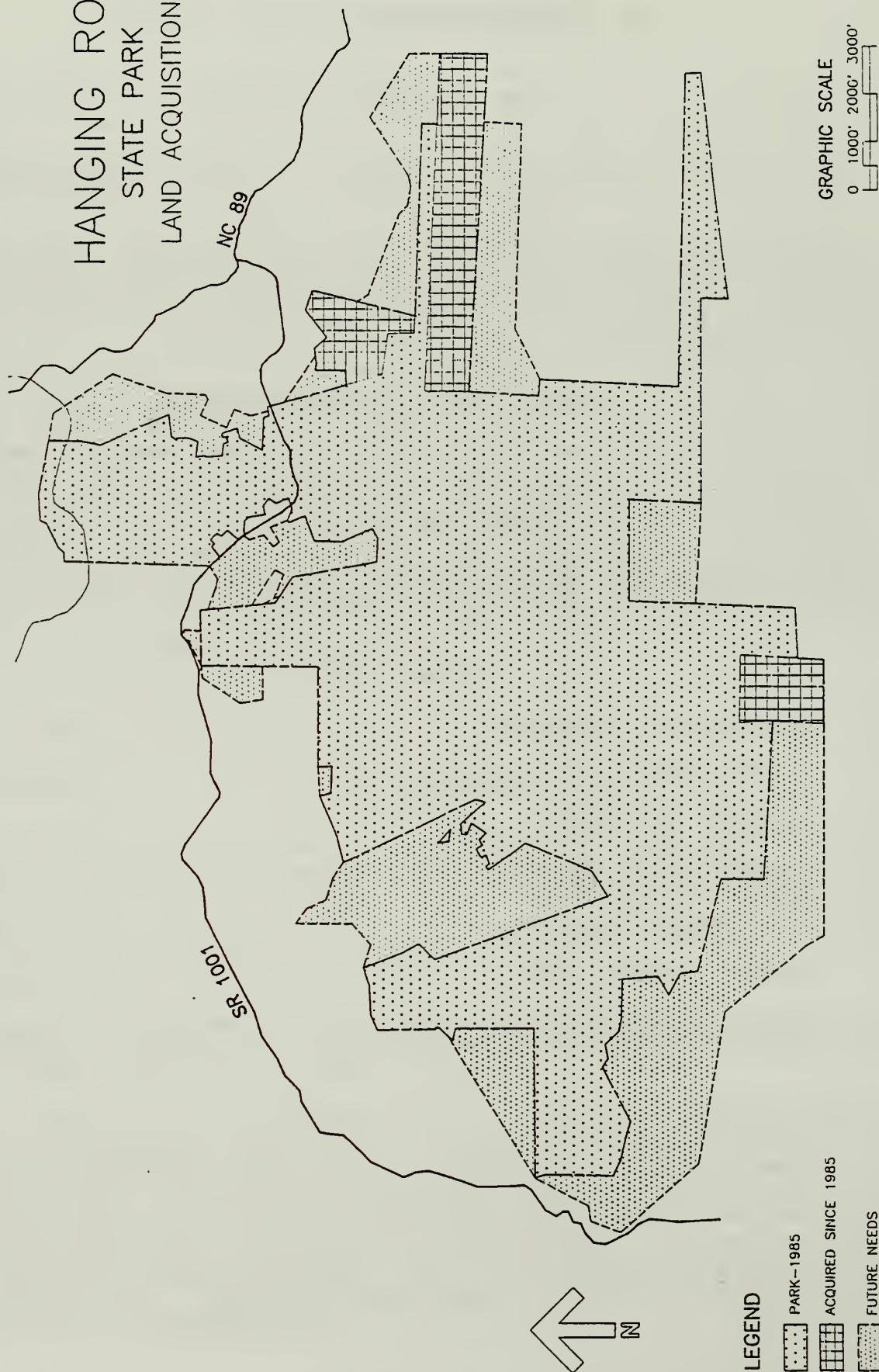


Figure IX-1. Land Acquisition Needs

APPENDIX A

PARK PROFILE

Location: Stokes County

Size: 6,341 acres

Established: 1936

Facilities:

Boat dock with boat rentals
 Cabins (6 units)
 Group camping (2 primitive areas)
 Picnicking (2 areas, 137 tables, 3 shelters)
 Swimming lake with a bathhouse and concession stand
 Tent and trailer campsites (73 sites)
 Trails (hiking - 18 miles, bridle - 2 miles)

Existing Staff:

Permanent:

Park Superintendent
 Park Ranger (3)
 Maintenance Mechanic (2)
 Clerk Typist (1/2)

Seasonal

Park Attendant (3)
 General Utility Worker
 Refreshment Stand Manager
 Refreshment Stand Clerk
 Bathhouse Manager
 Bathhouse Operator
 Lifeguard (5)

Peak Load

Clerk Typist (1)
 Park Attendant (2)
 Lifeguard (2)
 Refreshment Stand Clerk (2)
 Bathhouse Operator (5)

Statistics:

Visitation (Calendar)
 Operating Budget
 Revenue

FY 1990-91

262,317
 250,642
 155,784

APPENDIX B

CAPITAL IMPROVEMENT REQUESTS

North Carolina's Division of Parks and Recreation

AUG 21, 92

Page 1

Projects By Park In Priority Order

Description	Job Codes	Dst Cde	Locations	Mean Score	Total Costs
itor center	124N 5 1	WES	Hanging Rock	628	\$ 1,799,400
il renovations	40R 5 1	WES	Hanging Rock	582	\$ 1,507,200
ental cabins	188N 5 1	WES	Hanging Rock	538	\$ 360,700
op camp/family campground improvements	220R 5 1	WES	Hanging Rock	494	\$ 91,500
lding renovations	530R 5 1	WES	Hanging Rock	483	\$ 101,800
eral utility repairs	610R 5 1	WES	Hanging Rock	473	\$ 228,000

					\$ 4,088,600

					\$ 4,088,600

al number of jobs reported = 6



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